

**JOURNAL**  
*of the*  
**American Veterinary Medical  
 Association**

**FORMERLY**  
**AMERICAN VETERINARY REVIEW**  
 (Original Official Organ U. S. Vet. Med. Ass'n)  
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**JOURNAL**  
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J. R. MOHLER, Editor, Washington, D. C.

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**PRESIDENT C. A. CARY**

OUR newly elected president, Dr. Charles Allen Cary, is an American by birth as well as in sentiment and practice. On his father's side his lineage is traceable to a vigorous, thrifty strain of the English stock that came to the Massachusetts Bay Colony in 1634, and on his mother's side he is of Scotch-Irish descent. Thus he was favored with a rich combination of racial characteristics to begin the battle of life.

About 1857 William Cary, his father, and Lucy Ellen Cary, his mother, were attracted to the fertile plains country that was developing so rapidly west of the Mississippi river. They migrated from the East to Millersburg, Iowa, and it was here that Dr. Cary was born on November 27, 1861. During his early life in Iowa, Charles worked and studied with more than the average industry of the growing boy. In 1885 he was graduated from the Iowa State College with high standing, among the first ten upon whom the degree of Bachelor of Science was conferred. In 1887 he completed the course in veterinary science in the veterinary department of the same institution, and graduated with the degree of Doctor of Veterinary Medicine.

After graduation Dr. Cary located at Keokuk, Iowa, and pursued the practice of veterinary medicine there until 1889, when he accepted the position of professor of veterinary science in the South Dakota Agricultural and Mechanical College. He remained in South Dakota until 1892, with the exception of the winter of 1890, which was spent in post-graduate work at the University of Missouri. At the beginning of the year 1892 he accepted a temporary assignment of three months at the Alabama Polytechnic Institute, and the remaining nine months of that year were spent in the study of medicine and language in Germany. On his return from Europe, in 1893, he accepted the chair of veterinary science in the Alabama Polytechnic Institute and has been a member of the faculty of that institution continuously to the present time.

In addition to his duties as professor in the college, Dr. Cary has been actively engaged in agricultural, live stock, and important community matters. For a number of years he has been rendering distinguished service in Alabama as State Veterinarian; he served a long term as a member of the Auburn City School Board, and for more than twenty-five years he has served as president of the Alabama Live Stock Association. As a churchman Dr. Cary is of the Presbyterian faith, and his high standing in the community is also reflected favorably in the honors that have been conferred upon him by various organizations of which he is a member, notable among which are the Masonic and Knights of Pythias fraternities.

Busy as his life has been in endeavors to elevate his profession, in teaching and in investigations in veterinary science, in advancing agriculture, in promoting the live-stock industry of the Southland, and in serving his community, he has found time to write many papers, both technical and popular, and his articles on sanitary, public health, and live-stock matters are sought by the editors of our leading publications in those fields. His high ideals, his comprehensive vision, his tenacity of purpose, his unflagging zeal and devotion to his profession and his friends command universal admiration and respect.

The A. V. M. A. is to be congratulated on its selection of so competent and worthy a representative of the profession as its president, and THE JOURNAL joins his many friends in wishing him a successful administration.

### ECHOES FROM THE NEW ORLEANS MEETING

THE veterinarians of America have gloriously passed another milepost in the history of the profession. The fifty-sixth annual meeting in New Orleans was a splendid success from the smallest feature of the entertainment to the execution of the most technical part of the program.

In all, the program was excellently arranged and combined a discussion of a wide variety of practical subjects. Near the close of the session it became rather congested and required another half day to complete it. Among the participants on the program were representatives from all parts of the United States, as well as from Canada. A careful study, however, reveals the fact that the practitioner was not so well represented as he should have been. Nevertheless no one individually should be censured for this because it is a condition that must be remedied through closer co-operation.

The officers, the various committees and the Executive Board admirably fulfilled all their obligations without respect of persons and, so far as could be observed, for the interest of the Association and its future welfare.

The attendance was far more than was expected, considering the long distance that many had to travel and the high cost of living and transportation. More than 500 men and about 150 ladies registered, and it is presumed that a few of the members and a number of the visitors did not record their names.

For the occasion the weather was ideal. The days were clear and invigorating, while the evenings were balmy but tinged with sufficient sharpness of the atmosphere to induce pleasant sleep. Not a drop of rain dampened the streets, nor did a cloud darken the sky.

The ladies appeared to be busy every minute and their stay was one continuous round of pleasure. The men enjoyed their presence and only wished there could have been more of them, for the charming qualities of the fair sex go a long way toward making any convention a success.

The playhouses, the French Opera, the boat ride, and the restaurants with their characteristic cuisine were generously patronized and hugely enjoyed. Very little more could have been wished for; in fact, not even excluding the president's reception and the banquet, it was one of the most democratic occasions that we have had an opportunity to observe.

The election of officers passed off with very little confusion, and the newly elected officials promised solemnly to render a full measure of efficient service to the entire Association regardless of factions or sections. The honor of the A. V. M. A. should be paramount in their minds, and, with such resolutions in view, the members will strive with them to that end.

For a long time members had been anticipating the meeting. Therefore they began to arrive as early as Sunday, and, with the exception of a few, did not leave until the following Friday. The lobby of the Grunewald during mornings, noons and evenings was constantly filled with groups of old friends recalling experiences of bygone days. Let us hope that the same friends may be permitted to greet one another again under similar happy conditions.

E. I. S.

#### A REVIEW OF 1919

OUR Association is indeed fortunate in having called to its service men like Ex-President V. A. Moore and President C. A. Cary during these trying days of reconstruction. The sterling ability, the rare resourcefulness and the untiring efforts of such men, who have been and who are now leading the American Veterinary Medical Association to more important public service, are valued possessions in making for the success of our organization.

It was with a feeling of deep regret that the members saw the term of Dr. Moore come to an end. His administration of 15 months was characterized by continued progress, as great as any in the history of the Association. It would be impossible to summarize the extent of Dr. Moore's service or the many activities supported by him during the year. He was ever at the beck and call of State organizations and other medical and veterinary gatherings which needed his inspiration and advice. He, with many others, was instrumental in obtaining from the National Congress increased funds for paying better salaries to veterinary inspectors. He traveled to a number of States to present educational and sanitary control matters of international importance which would prove beneficial to the A. V. M. A. During his administration there were 772 applicants elected to membership, which is the second highest number that have been taken into the Association at any one meeting. While this is very satisfactory, it is equally pleasing to note by the treasurer's report that the financial condition of our organization has become greatly improved. Notwithstanding the vastly

expanded cost of conducting our affairs, this healthy state of the finances will permit larger projects to be undertaken in the future. Moreover, it will allow the Association to attain a higher place in keeping with its objects and to become more truly the great American association whose prosperity depends on the advancement of the veterinary profession of America.

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#### THE NEW HOME OF THE JOURNAL

SOME complaints of the delayed arrival of the January issue of THE JOURNAL will probably be received from some of our subscribers. By way of explanation our readers are reminded that THE JOURNAL is now printed in Washington, D. C., instead of Baton Rouge, La., and that incidental to the change there have been some unavoidable delays. Until the new arrangement is complete and in smooth working order we must ask our readers to bear with such delays as may occur in the receipt of their copies.

The new editor of THE JOURNAL enters upon his duties at a most unpropitious time. Unfortunately this year the International Live Stock Show, the meeting of the United States Live Stock Sanitary Association, the hearings before the Agricultural Committee of the House of Representatives and those before the Congressional Commission on the Reclassification of Salaries have all been crowded into the month of December with the holiday festivities. In addition the United States Fuel Administration has ordered the publishing houses in this city to remain closed on Tuesdays, Thursdays and Saturdays in order to conserve the coal supply and this will greatly handicap the printers in getting the January number out promptly. However, our predecessor has already requested forbearance on the part of the subscribers until some of these unavoidable complications have adjusted themselves.

The hearty co-operation of all the members of our Association is earnestly solicited, as THE JOURNAL has reached the stage when it can not be handled successfully by any one individual. We particularly urge the practicing veterinarians to send in the papers that they present at the various State and county meetings, also reports of their interesting cases. THE JOURNAL can not cater to the needs of the practitioner unless the practitioners themselves provide the papers and case reports requested.

**MORE AND BETTER LIVE STOCK VERSUS PARASITES**

WITH the end of the campaign against the cattle tick already in sight, the movement for more and better live stock in the South is attaining considerable impetus. However, in this movement there are certain obstacles to overcome that must not be lightly disregarded.

The eradication of the cattle tick will remove one enemy that has kept the live-stock industry of the South down to its present comparatively small holdings. The expansion of that industry to the larger holdings of better stock that have been rendered possible by tick eradication must, however, be made on a conservative basis or more or less serious trouble is certain to be experienced. In other words, with the eradication of the tick there still remain other parasites that will prove very bothersome to those live-stock owners who fail to observe proper precautions in the management of their animals. Complaints of damage from internal parasites of live stock are becoming more frequent, and a warning by the Bureau of Animal Industry to the veterinarians of the South at the recent meeting of the American Veterinary Medical Association at New Orleans brought out the fact that the warning was none too early and that serious losses among horses, mules, cattle and sheep were occurring on many farms through the neglect of certain fundamental principles in the control of parasitic diseases.

The South generally has a climate which furnishes certain very injurious parasites with conditions highly favorable to their propagation, that is, a climate characterized by abundant warmth and moisture throughout almost the entire year. The check on these parasites imposed in the Northern United States by dry and cold seasons is largely lacking. Attempts, therefore, to stock southern pastures up to approximately what their feed production would seem to warrant or to the extent commonly practiced in cooler, drier climates, are likely to result in considerable wastage from losses by parasitic diseases, if not in the first year, then in the two or three years necessary for the pastures to become heavily infested, during which time also there may be a tendency to increase the holdings of live stock beyond the number that may be safely carried on a given area.

The spread and development of man and his live stock in tropical and semi-tropical countries has always been limited by parasites, and it is only by adequate control of parasites that civilized man

can expect to maintain himself and his flocks in prosperity in warm countries. In the South man has suffered from yellow fever, bubonic plague, malaria and hookworm, all diseases due to parasites or carried by parasites. The first two have been eradicated, the last two are being controlled. His live stock has suffered from Texas fever and its tick carrier and from many kinds of parasitic worms and insects. Texas fever and the tick will soon disappear, but the problem of controlling worm and insect pests is now urgently demanding solution. Serious losses at the very beginning of the new live-stock industry in the South will tend to give the project a bad reputation that it may take years to live down. The time has come for all persons interested in the southern live-stock industry to insist that appropriate measures be taken to protect it from the hindrance of uncontrolled parasitic diseases.

Some of the important measures that will help to control parasites under southern conditions and to prevent serious losses are as follows: A large margin must be maintained between the number of live stock on a given area and the number which that area will apparently support as judged by northern standards. Provision should be made for frequent movement to fresh grazing areas; the use of permanent pastures should be minimized; forage crops should be utilized as much as possible, and low-lying, swampy areas should be avoided. Horses, swine and ruminants (sheep and cattle) may be grazed in turn upon the same fields with little risk of serious spread of parasitic diseases from one kind to another, but sheep and cattle can not follow one another with safety in the absence of other precautions, as several kinds of parasites, including the stomach worm, are common to both sheep and cattle. Because the dog is responsible for the conveyance and spread of certain dangerous parasites of man and live stock, the all too common wandering dog must be suppressed.

It is safe to assume from the outset that parasites in small numbers at least are always present and liable to become troublesome if given an opportunity to increase in numbers. This opportunity may come with an unusually wet season or through the failure of the live-stock owner to take measures to control parasites, which, under conditions favorable to them, multiply rapidly and soon become numerous enough to cause great damage. Together with measures for controlling parasites, the use of medicinal treatment will commonly be necessary, and in this connection competent veterinarians who have learned the best methods for the treatment and

control of parasites can render valuable service to the live-stock owner.

In addition to the practical application of such knowledge as is already available, the inauguration of a more comprehensive program of research along the lines of parasite control in the South is imperative. Every southern experiment station should have a capable parasitologist on its staff to investigate local conditions and to add much-needed information to our comparatively meager knowledge of parasites in the South. Liberal provisions should be made for such investigations, as their cost will be many times repaid by the avoidance of the losses that will surely follow through ignorance of the proper management of live stock to avoid damage by parasites.

B. H. R.

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#### NEW MEMBER FOR EXECUTIVE BOARD

On account of the expiration of Dr. J. R. Mohler's term of office on the Executive Board a new member is to be elected by postal card votes from District No. 4. This district includes Maryland, Virginia, District of Columbia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Kentucky, Tennessee, Cuba and South America. Return postal cards for nominations are being sent out from the Secretary's office.

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#### EDITOR'S NOTES

Unfortunately, none of the proceedings or papers of the New Orleans Convention has reached this office as yet, so we are forced to go to press without any of this material. However, we hope to have the entire proceedings in our possession in time to start publishing the first papers in the February number.

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Every member of the A. V. M. A. who has not paid his dues for the current year should send in \$5.00 immediately to the Secretary's office. The final statement is being sent out to those who have not paid for the present fiscal year. Don't delay in sending your remittance as you will miss your JOURNAL, because it will be necessary to stop the Journals of those who have not sent in their dues.

## PROGRESS IN HOG CHOLERA CONTROL<sup>1</sup>

By U. G. HOUCK, Washington, D. C.

### THE IMPORTANCE OF THE SWINE INDUSTRY

THE United States at the beginning of the present year contained approximately 42 per cent of all the hogs in the world. Our swine population at that time numbered 75,587,000, which was more than the combined total number in any other ten countries. This number does not include those farrowed since January 1, 1918, and marketed before January 1, 1919. During the past year the flesh of swine constituted nearly one-half of our meat diet, and more than two-thirds of our total exports of dressed meat were pork products, while of animal fats exported more than five-sixths was lard. Within the last ten years the population of this country has increased about 39 per cent. Our pork production is the only branch of the meat industry that has been able to keep pace with the rapid increase of population. When it is realized that in one year (1918) we produced 11,226,000,000 pounds of pork products, with a surplus of about 2,250,000,000 pounds, it is evident that this great and growing national industry is deserving of our fostering care.

### HOG CHOLERA THE MOST DESTRUCTIVE DISEASE OF SWINE

It is established by evidence on every hand that hog cholera has been and continues to be the greatest impediment to the swine industry, since it, with its complications, is responsible for about 90 per cent of the mortality of hogs that die on farms and in feed lots. Last year more than two and one-half millions of hogs in the United States were allowed to die from hog cholera. The fact that for the past 11 years we have had a reliable preventive treatment at our disposal and yet have allowed this heavy loss to continue seems to indicate that we are not giving to the swine industry as much protection as it should receive.

### CONFIDENCE ESTABLISHED IN SERUM

In 1908 the United States Department of Agriculture commenced to urge the immunization of swine against hog cholera by what is known as the Dorset-Niles treatment. While State institutions seemed slow to realize the possibilities from the use of this treat-

<sup>1</sup> Presented at the twenty-third annual meeting of the United States Live Stock Sanitary Association, Chicago, Ill., December 1, 1919.

ment, commercial establishments grasped the opportunity to supply the public demand for serum and virus, and up to July 1, 1913, they were allowed to prepare and handle these products in their own way without State or National supervision.

The impotent and contaminated serum and virus placed upon the market prior to the passage of the virus-serum-toxin act, together with faulty technique in administering the treatment and the inability of many veterinarians to differentiate hog cholera from other swine diseases, produced disappointing results in so many instances that the immunization treatment was not growing in popularity as it deserved. In some sections it was regarded with doubt and in some instances with disfavor. Up to this time the Department had undertaken no extensive field experiments or demonstrations for the eradication of hog cholera, but during the widespread outbreak of the disease in 1912 the Bureau of Animal Industry decided to conduct in selected areas some demonstrational and investigational hog-cholera work, directed by the Biochemic Division, in co-operation with the State regulatory authorities and extension divisions of Agricultural Colleges, to ascertain the best adaptable methods for controlling hog cholera and to show livestock owners and others how they might reduce their losses from the disease through the proper use of potent serum and virus properly administered in conjunction with the application of quarantine and sanitation. A sum of \$75,000 was made available through appropriation by Congress for conducting such activities during the fiscal year 1913. At the beginning of the fiscal year, July 1, 1912, the work was commenced in Dallas County, Iowa, and before the end of the calendar year it had been extended to four counties, each located in a different State.

The results obtained from the use of serum in connection with the other repressive measures employed were so gratifying and the demands for extension of the service were so pressing that on February 23, 1914, Congress appropriated \$450,000 to continue the activities against hog cholera. The work was gradually extended to 17 counties in different portions of the country in the latter part of 1914, but the outbreak of foot-and-mouth disease in the fall of that year made it necessary to drop it in two counties and interfered with it materially in others. The satisfactory results obtained by the Bureau and the co-operating agencies established confidence in the preventive treatment and gave an impetus to the production and use of serum throughout the country, and hog production was

greatly increased in the areas covered by the demonstrational and educational work.

#### EXTENSION OF HOG-CHOLERA CONTROL WORK

Funds were provided by Congress to continue the work during the fiscal year 1916, and on January 1 of that year the Office of Hog-Cholera Control was established in accordance with the policy of the Department to segregate research, extension and regulatory work from each other. Up to this time the activities in the selected counties were carried on with free serum and virus administered by Bureau veterinarians free of charge. This plan served a useful purpose, but it proved impractical and too expensive for extending the activities to cover a larger territory. Therefore in 1916 the Department discontinued furnishing free serum and the operations were restricted to 10 States but extended to cover larger areas in each State. Under this arrangement assistance was given to 127 counties in the 10 hog-growing States selected.

The sum provided by regular appropriation for hog-cholera work was increased in August, 1917, by an allotment of \$196,400 from the war emergency funds, which made it possible further to intensify the work and to extend it within the remainder of the fiscal year from 127 counties in 10 States to 295 counties in 14 States. A special feature of the project in 1917 was the successful efforts in enlisting the support and co-operation of practicing veterinarians, resulting in more uniform and successful methods of treatment and charges.

The allotment from the war emergency fund for hog-cholera control for the fiscal year 1918 was increased to \$202,965. By the judicious use of this sum, in addition to the regular appropriation, the Bureau was able to extend further its co-operative activities from 295 counties in 14 States to State-wide efforts in 34 States. The extension of the work as a war measure gave swine breeders better protection against losses from hog cholera than they had ever before received, and there was an increase of about four millions in our hog production and a marked decrease in the losses from swine diseases. The mortality fell from 119.9 per 1,000 in 1914 to 42.1 per 1,000 in 1913, which was the lowest in 35 years.

#### PROGRESS OF THE WORK DURING THE LAST FISCAL YEAR

In April, 1919, the Office of Hog-Cholera Control was made a division of the Bureau of Animal Industry. The work under this

division has progressed along the same lines as in the preceding year, in co-operation with State regulatory authorities and the extension divisions of State Agricultural Colleges in 34 States where hog raising forms an important part of the farming activities.

There was an increase in hog production of more than four millions over the preceding year, and notwithstanding this large increase in the number of swine and the abnormal conditions that prevailed as a result of the war, the mortality of swine from all diseases was further reduced from 42.1 per 1,000 in 1918 to 41.4 per 1,000 in 1919, which is equivalent to about 37 per 1,000 from hog cholera. This is the lowest mortality that has been recorded in 36 years.

To cope with the abnormal conditions during the war the field force was increased in the early part of the last fiscal year considerably above the average for the 12 months, which made it necessary later to reduce it accordingly and restrict operations in order to hold the expenditures within the limits of the appropriation. As seven States were able to give financial assistance in maintaining the forces in the field until the present appropriation was available, it did not become necessary to discontinue entirely the operations in any State. The assistance furnished by these seven States was appreciated by those engaged in the swine industry as well as by the Bureau.

The work of the field inspectors was materially increased during the year through the necessity of giving attention to the many additional garbage-feeding stations established in the neighborhood of large cities and army camps and the repeated observations of the live stock on farms in various States to which the 614,673 feeder hogs were shipped after immunization at public stockyards.

During the fiscal year ended June 30, 1919, there were 12,336 outbreaks of hog cholera reported to the Bureau inspectors by county agents, live-stock owners and others in the 34 States. A total of 53,586 postmortems were conducted in connection with the 51,022 investigations made on farms where outbreaks of disease occurred. Appropriate literature was widely distributed and 2,734 meetings were held in hog-raising districts for the purpose of forming organizations and giving information to live-stock owners concerning the application of quarantine, sanitation and the serum-prevention treatment as the most successful means of preventing losses from hog cholera. These meetings were attended by 78,584 farmers and others, and in addition the inspectors had personal interviews with 315,359 live-stock owners, bankers, veterinarians,

county agents and others at their homes, places of business, or in the offices at the local headquarters.

During the year 93,512 farm visits were made by the inspectors at the request of the owners or otherwise to observe the conditions of live stock and to give advice and other assistance. There was a marked increase in the number of farm visits last year, because the inspectors have come to realize more fully than ever before that the nearer they can get to the stock raiser the more good can be accomplished, and that there is no place so favorable for discussing these matters with a farmer as in the feed lots on his own farm. In the performance of their official duties the Bureau representatives traveled 2,029,519 miles; they treated 233,987 hogs for demonstrational purposes, and the reports seem to indicate that at least 12,000,000 in addition were treated in the United States by veterinary practitioners and others.

Under the direction of the co-operating regulatory authorities in the 34 States, 9,564 farms were quarantined on account of hog cholera, and 4,382 of these were cleaned and disinfected. Considering the number of outbreaks that were reported during the year, it seems that the importance of quarantine and disinfection is not fully appreciated by either the State authorities or live-stock owners and that these matters are not receiving the attention they should.

During the calendar year 1918 about 528,306,874 cubic centimeters of serum was used, the mortality of swine was further lowered, and in general much good was accomplished; but at the same time swine owners allowed 2,815,000 hogs to die of cholera, which shows that we are not making as rapid progress as we might in preventing losses or in eradicating the disease. The best results that we may hope for, until the work is intensified and extended through more liberal appropriations, closer co-ordination of efforts and more effective co-operation by all concerned, is only a fair control of the disease through the liberal use of serum and the application of such sanitary and quarantine measures as we are able to apply under existing conditions.

Attention seems to be centered on immunization while we are generally negligent in regard to efforts to prevent the spread of the infection from primary outbreaks. It does not seem to be fully appreciated that quarantine, cleaning and disinfection are of as much importance in combating hog cholera as they are in eradicating outbreaks of such diseases as foot-and-mouth disease, glanders or anthrax.

## FUNDS FOR HOG-CHOLERA CONTROL

The matter of funds is an important feature of co-operative hog-cholera work. Up to the present time some of the largest and richest hog-growing States have not provided funds to co-operate effectually with the Department in combating hog cholera within their borders. It might be expected that any State receiving assistance from the National Government would appropriate at least as much money for co-operation as the National Government is willing to use in that State. The hog-cholera work has advanced beyond the experimental stage, and in future those States which do not provide adequate funds for co-operation with the Bureau should not expect to receive the same consideration in the allotment of Bureau funds as those which make liberal appropriations for co-operative hog-cholera work.

At the present time the Bureau has 140 veterinarians detailed to hog-cholera work in 34 States. If the States had an equal number devoting their entire time to the work, the losses from hog cholera could be reduced sufficiently to bring very large returns to the swine industry from the investment. We are approaching the time when a State receiving assistance in hog-cholera work will be expected to assign continuously to the work at least as many veterinarians as the Bureau furnishes. Congress appropriated \$446,865 which may be used for hog-cholera control work during the present fiscal year. A recent survey showed that the combined available funds of the 34 States for co-operation with the Bureau probably will not amount to over \$250,000, which is about one-eleventh as much as 44 States have appropriated for tuberculosis eradication work and about one-fourteenth as much as was provided for tick eradication in 1918 by the States and counties in the 10 States where that work was carried on.

From present indications it seems quite probable that the southern cattle tick will be exterminated and that tuberculosis will be eliminated from our breeding stock, while the great losses from hog cholera will continue to drag along from year to year unless swine owners, through their organizations, make known their wishes and give better support to the live-stock sanitary authorities in their efforts to induce State legislatures to make more liberal appropriations to combat hog cholera.

## STATE LIVE-STOCK LAWS AND REGULATIONS

There are a number of matters of importance in connection with the hog-cholera work that might be discussed, one of the most im-

portant of which is State laws and regulations. Various State authorities and prominent members of live-stock associations have commented liberally on the variations in State laws and regulations affecting the movement and supervision of live stock to prevent the introduction and spread of disease, and suggestions have been made in regard to the desirability of uniformity. Under present conditions shippers of breeding animals are frequently subjected to inconveniences and annoyances and have a reasonable excuse for their mistake in shipping interstate. The radical differences that exist in the requirements of different States are bewildering and inexplicable and give opportunities for just criticism on account of the apparent contradictions expressed in official regulations. The agents of transportation companies can scarcely be expected to keep themselves informed on the varying requirements and frequent changes in the different States, and in general there is confusion and considerable dissatisfaction.

It seems reasonable to suppose that laws and regulations which have been found necessary to protect one State against the introduction and spread of hog cholera would prove equally effective and desirable in any other State. The differences that exist in State laws and regulations are probably due to the variations of public sentiment that exist in different sections of the country. In some States the live-stock sanitary authorities have been unable, when they have tried, to secure the passage of laws which they know to be important to protect properly the live-stock industry. In other States they hesitate to attempt to enforce the good laws they have because of the low ebb of public sentiment. It is generally recognized that any policy that is adopted for combating contagious animal diseases must have the support of public sentiment to prove successful. This has been demonstrated in the eradication of such diseases as foot-and-mouth disease, sheep scabies and the Texas-fever tick. Where public sentiment is strongly in favor of tick eradication the ticks disappear rapidly, but in those communities where dipping vats have been repeatedly dynamited the extermination of the tick is prolonged and the task is more irksome and expensive.

Live-stock men generally are intelligent, and if they were made to understand, through their organizations or otherwise, that rigid, uniform State laws and regulations are needed better to protect their interests there is no doubt that they would give their support to such measures. There is a need for specifically directed educational work to bring about uniformity in State live-stock laws and

regulations. It might be charged that the requirements of some States are inadequate and that the live-stock sanitary authorities of some States have not given this matter the attention that it deserves.

#### VARIATIONS IN STATE LAWS AND REGULATIONS RELATING TO SWINE

Recent official correspondence with State live-stock sanitary authorities in connection with the revision of a Bureau publication entitled "State Sanitary Requirements Governing Admission of Live Stock" show the following facts, tabulated to show at a glance the radical differences that exist in State requirements:

##### *Admission of Hogs Intended for Breeding Purposes*

|  | <i>States</i> |
|--|---------------|
| No requirements.....   | 7             |
| Permits required.....  | 4             |
| Permits required if from public stockyards.....  | 1             |
| Accepted on affidavit of shipper.....  | 8             |
| Accepted on affidavit if for exhibit.....  | 1             |
| Accepted on affidavit or health certificate.....   | 3             |
| Accepted on affidavit if from a district free from cholera.....  | 1             |
| Health certificate required.....   | 31            |
| (The time required for premises at point of origin to be free from hog cholera varies from 6 weeks to 6 months.)   |               |
| Immunization required.....   | 13            |
| Immunization required if from public stockyards.....   | 2             |
| (The time required to elapse before shipment following immunization with serum alone varies from immediately to 30 days, and for serum and virus from 3 hours to 30 days.) |               |
| Disinfection of animals required.....  | 9             |
| Disinfection of animals required if immunized with serum and virus .....   | 1             |
| Disinfection of cars before loading required.....  | 11            |
| Disinfection of shipping crates required.....  | 5             |
| Quarantined at destination if from public stockyards.....  | 3             |
| Health certificates required for hogs intended for exhibition purposes .....   | 4             |

##### *Admission of Hogs Intended for Feeding Purposes*

|  |    |
|--|----|
| No requirements .....  | 8  |
| Permits required .....   | 7  |
| Shipments may be made on affidavit of shipper.....   | 5  |
| Health certificate required.....   | 30 |
| Health certificate or immunization required.....   | 3  |
| Immunization required .....  | 12 |
| Immunization required if from public stockyards.....   | 3  |
| (The time required to elapse before shipment following immunization varies from 3 hours to 90 days.) |    |

|  | <i>States</i> |
|--|---------------|
| Disinfection of animals required.....  | 10            |
| Disinfection of animals required if treated with serum and virus.....  | 1             |
| Disinfection of cars before loading required.....  | 13            |
| Quarantined at destination.....  | 7             |
| Quarantined at destination if from public stockyards.....<br>(Time held in quarantine varies from 21 to 30 days; in one State as long as necessary.) | 1             |
| Not to be unloaded in public stockyards en route.....  | 9             |

These figures speak for themselves and other comment is unnecessary. It is suggested that this Association give some attention to this matter. As the first step in attempting to secure more uniform regulations affecting the movement of swine, it is further suggested that the Committee on Hog Colera might prepare for the consideration of this body a tentative draft of regulations which would seem generally adaptable for governing interstate and intrastate movements of swine and afford a reasonable guaranty against the introduction or dissemination of hog cholera. It is believed that the Federal regulations should be incorporated as a part of State regulations.

In the control of hog cholera the National and progressive State authorities are especially impressed with the importance and desirability of uniform State requirements affecting the following matters:

1. The immunization of swine as a requirement for admission into a State.
2. The enforcement of an effectual quarantine on the farms at destination of all swine from public stockyards or from another State for feeding or breeding purposes.
3. Quarantining premises where hog cholera appears, posting notices and issuing warnings.
4. Compulsory reporting of outbreaks of the disease.
5. Effectual destruction of the carcasses of animals that die of disease on farms and in feed lots.
6. Cleaning and disinfection under proper supervision of infected premises.
7. Cleaning and disinfection of cars and crates used in the transportation of live stock for feeding, breeding or exhibition purposes.
8. Licensing and supervision of garbage-feeding plants.
9. Effectual control of the distribution of hog-cholera virus.

#### CONTROL OF THE DISTRIBUTION OF HOG-CHOLERA VIRUS

Much might be said on each of the subjects above specified if time permitted, but there is one point that stands out prominently at this time, since laymen seem to be losing their fear of virus and are

inclined in some sections to undertake to use it in the immunization of their own herds and those of others.

The discovery of the effects of hog-cholera virus in conjunction with the use of serum was a wonderful boon to the swine industry. Virus is generally recognized as a vital factor in the control of hog cholera, but it is dangerous. There is no doubt that there have been many outbreaks of hog cholera resulting in great losses through the careless handling and use of this product. The present practice of permitting serum companies to ship virus promiscuously on order without supervision or check is deserving of serious consideration. The State authorities who are charged by law with the protection of the live-stock industry are the proper persons to distribute the virus or control its distribution within their respective States. If only State officials would take control of the distribution of this product they could specify who should and who should not administer the simultaneous treatment, and thus could prevent virus from getting into the hands of incompetent, unreliable and unlicensed individuals.

According to the correspondence previously specified, at present only seven States are attempting to control the distribution of virus. Expression has been given to the belief of many correspondents that the Federal regulations should prohibit the interstate shipment of virus to any but authorized State officials; but the States are not prepared for such a regulation and probably there are some that would oppose it. However, an important step will have been taken toward reducing the losses from hog cholera and toward eradicating the disease when all the States can see their way clear to place the distribution of virus within the States under the control and supervision of the live-stock sanitary authorities.

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Dr. Alvin O. Lundell, inspector in charge at South St. Joseph, Mo., who has been in the service of the Bureau of Animal Industry since 1905, has resigned to accept a position with the Albright-Nell Company, of Chicago, manufacturers of packing-house machinery.

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Dr. Harry Grafke, in charge of the Bureau work at Fort Worth, Texas, exclusive of meat inspection, after twelve years' service in the Bureau has resigned to enter the employ of a biological house.

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Dr. Floyd N. Jenkins of Fort Worth, Texas, has resigned from the service of the Bureau of Animal Industry to accept a position with the State Live Stock Sanitary Commission of Texas.

## THE ETIOLOGY OF SO-CALLED INFECTIOUS ABORTION DISEASE OF CATTLE<sup>1</sup>

By E. C. SCHROEDER, Bethesda, Md.

AT the beginning of this paper I believe it desirable to say that the disease about which it is my intention to speak, and to which my statements pertain, is the so-called infectious abortion disease of cattle obviously due to the Bang abortion bacillus.

It is in no sense my wish or intention to discredit the belief, or rather the inference, that abortions among cattle, and conditions which lead to abortions, may be caused by germs like the spirillum of Smith and the vibrio of Stockman and McFadyean, or by various septic and pyogenic bacteria, or by the occasional pernicious activity of micro-organisms which commonly inhabit animal bodies as commensal parasites, or even by the absorption of toxic substances; but, unless I am greatly mistaken in my valuation of the known facts, we are reasonably entitled to conclude, no matter how many different causes may be responsible for abortions, that only one common, widespread, infectious abortion disease among cattle has been definitely proved to exist, and that this is the disease of which the Bang abortion bacillus is the prime etiological factor.

I frankly admit, since knowledge is progressive and human conceptions are very mutable, that the discovery of more facts may require in coming time a modification of this conclusion, but that is a matter which we must leave to the future. We are dealing with the present, and the conclusions of any period of time, in the full measure to which they merit approval as a serviceable and rational basis for practical action, should be in harmony with the known facts of that period.

Now, recognizing that abortion disease among cattle may have many causes, the individual nature and importance (either or both) of which remain to be determined, and one cause that has been proved to be both common and widespread, namely, the Bang abortion bacillus, and keeping in mind that efforts guided by a knowledge of the etiology of a disease promise the best results when its control or eradication is undertaken, it seems that it would be advantageous to survey some of the major facts that we know about

<sup>1</sup> Presented at the twenty-third annual meeting of the United States Live Stock Sanitary Association, Chicago, Ill., December 1-3, 1919.

the Bang abortion bacillus and its relation to the animals it attacks.

The bacillus, so far as we have been able to learn, under natural conditions is an obligatory parasite which does not produce spores or special forms that are strongly resistant against the germicidal properties of light and drying. Hence, after it is expelled from the body of one host it does not again multiply until it has entered that of another, and it can not long survive in a free state unless it is well protected against the inclement features of its extra-host environment, and such protection would require that it should be imbedded in a moist, opaque, fairly voluminous and practically neutral medium.

The natural hosts of the parasite are cattle. It may also live in the bodies of other animals, as, for example, guinea pigs, in which it causes extensive, characteristic lesions of disease; rabbits, in the livers of which it may long persist without causing manifest changes; hogs, in which it is being reported with increasing frequency as a cause of abortion disease. But it is reasonably certain that its specifically true hosts are cattle and that its parasitism in the bodies of other animals is incidental and without true significance for its real perpetuation. In other words, we may say that, though the Bang bacillus can live and multiply in the bodies of other animals, it would probably be doomed to early extinction if it could be excluded from those of cattle, in precisely the same sense in which the bovine type of tubercle bacillus, which attacks many different species of animals, the human included, would soon become extinct if it could be excluded from the bodies of cattle.

Taking the host relationship and the general nature of the abortion bacillus into consideration, we may conclude that it is an organism with which it is not difficult to deal during its extra-host period through the practice of scrupulous cleanliness and the use of simple disinfectants, and that the disease it causes is an evil which spreads in the great majority of cases, quite probably, only through fairly intimate contact between infected and susceptible cattle.

Like many other parasites, bacterial as well as those of higher order, the abortion bacillus shows a marked preference for special regions of the bodies of its hosts. Its commonest habitat in the bodies of cattle, and the organ in which it persists longest, is the udder. Next to this is the pregnant uterus, or, more definitely, according to an investigation recently published by Dr. Theobald Smith, the outermost layer of the placenta. It also, but less frequently, inhabits the seminal vesicles and epididymides of bulls.

In the udder multiplication evidently is slow, and in the pregnant uterus rapid. About its multiplication in the reproductive organs of bulls we have no data on which we can base conclusions.

When the udder is infected, in practically all the cases examined, the supra-mammary lymph glands are also infected, and this is just what should be expected, since they are the glands through which the lymph system drains the udder. The occurrence of the bacillus in these glands indicates that it may enter the lymph and blood streams from the udder, and the failure to detect it in the numerous tests that have been made to discover it in tissues from all other parts of the bodies of cows with infected udders, like blood, spleen, liver, kidneys, brain, bone marrow, synovial fluid, ovaries, fallopian tubes, lymph glands, etc., seems to prove that the bodies of cows generally, apart from their udders and pregnant uteruses, do not provide a suitable habitat for it.

Presumably, when the abortion bacillus penetrates deeper into the body from an infected udder, unless it reaches a place like the pregnant uterus where it can establish itself and multiply, it is rapidly destroyed. That it can reach the pregnant uterus from the udder is proved, first, by inoculation experiments, in which the pregnant uterus was infected through the introduction of abortion bacilli into the udder through the teats with a milking tube, and, second, by the frequency with which the placentas and uteruses of cows with infected udders contain abortion bacilli even when such cows are apparently healthy and calve in a seemingly normal manner.

The abortion bacillus can not be proved to be present in the udder of every cow that is affected with abortion disease, neither can it be proved to occur in the pregnant uterus of every cow that has an infected udder; but this much is true: In the udder it may persist anywhere from a few weeks to seven or eight years, and, while it persists, if the examinations thus far made are reliable, at least half of the parturitions, though they may be manifestly normal in character, are accompanied by the dissemination of abortion bacilli from the uterus via the vagina. And this is a matter of exceptional importance, because it clearly shows that seemingly healthy cows are often long-lived carriers of abortion bacilli, and that such carriers, in addition to eliminating abortion bacilli more or less continuously with their milk, in a large proportion of cases expel them in a dangerous way during and shortly after calving and probably shortly before.

Studies relative to the occurrence of abortion bacilli in the non-pregnant uterus have given the following results. When an infected cow has aborted or calved, irrespective of whether the calving is or is not attended by sensible abnormal phenomena, the uterus and the material discharged from it may, and in a large proportion of cases do, contain abortion bacilli. The infected condition lasts from a few days to a few weeks. As a common rule, tests to discover abortion bacilli in the uterus three weeks after an abortion or a parturition give negative results, though we have one case on record in which they persisted nearly two months. The latter must be looked upon as a rare exception.

When abortion bacilli are injected directly into the non-pregnant uterus they disappear in a few days; and judging from numerous tests made at estrual periods and at other times, copious repeated injections of suspensions of abortion bacilli into the veins of non-pregnant cows do not infect the uterus.

Here we may conclude that the period during which abortion bacilli are disseminated by infected cows in large numbers is limited, because the parasite inhabits only two portions of their bodies, one, the udder, indefinitely, and the other, the uterus, for limited periods of time. From the infected udder the bacillus is discharged more or less continuously in small numbers, and from the uterus periodically in large numbers.

To overcome the danger due to abortion bacilli discharged from the udder should not be difficult. Milk is a valuable product and ordinary economy prevents it from being scattered about promiscuously in a cow stable. If it is accidentally spilled where it may do harm it should be sprinkled with lime or some other simple disinfectant. If it is sent to a creamery or a cheese factory from which skim milk or by-products are returned to the farm, the skim milk or the by-products should be sterilized before they are fed to animals.

At one time I advanced the opinion that abortion infection might occur through the udder with bacilli drawn into the teats during milking from the hands of milkers who had previously milked cows with infected udders. But, though I know perfectly well that abortion bacilli reach the uterus from the udder and that abortion disease can be produced by injecting abortion bacilli into the udder through the teats, I doubt whether this mode of infection has much practical importance. It is a possibility that should be kept in mind until further investigations have thrown more light on it, and a danger

which I believe can be avoided by washing the hands before going from one cow to another during milking.

The danger due to the bacilli discharged from the uterus when abortions occur and in connection with parturitions—and this evidently is the prime danger—should be controlled through the use of maternity stables. Cows should be moved to such stables the moment they show the first sign of approaching parturition or the least symptom of what may be a coming abortion, and should be segregated in such stables after calving or aborting until all abnormal discharges from their uteruses have ceased. The products of abortions and the by-products of parturitions should be disposed of in a manner which will prevent the exposure to them of cattle that are susceptible to abortion disease.

The maternity stable removes the cow from the herd during the approximately two to three weeks per annum in which she is very apt to be exceptionally dangerous—the only two to three weeks per annum during which cows affected with Bang abortion disease positively are known to scatter abortion bacilli in large numbers and in a dangerous way. And it is imperatively necessary in this connection to bear in mind constantly that the seemingly healthy carrier of abortion bacilli, the cow which shows no sign of her infected condition and calves in a seemingly normal manner, may be a superlatively dangerous disseminator of abortion germs at and shortly after her time of parturition.

In speaking about the habitat of the abortion bacillus in the bodies of cattle I failed to say anything about the various portions of the bodies of aborted fetuses and recently born calves in which it has been found, but it does not seem necessary to say much. The occurrence of the bacillus in fetuses impresses me as being similar to its presence in a sponge that has been immersed in a fluid contaminated with abortion bacilli, with this exception, that their digestive tract contains a fluid in which it can multiply and become very numerous. From the bodies of calves the germ disappears soon after they are born, even though they drink the milk of dams with infected udders.

Regarding calves I would suggest that it may be well to bear in mind that those which enter upon their independent existence from an infected uterus may expel abortion bacilli via their bowels during the first days after they are born, and also that those which are suckled by dams with infected udders may expel abortion bacilli,

against which they themselves are immune, via their bowels until shortly after they are weaned. This is simply a suggestion which is not supported by concrete evidence. Tests regarding it have been planned but I can not predict the results that they will give.

The importance of bulls as disseminators of abortion bacilli remains an open question. Investigations reported by Buck, Creech and Ladson of the Pathological Division of the Federal Bureau of Animal Industry prove beyond dispute that the reproductive organs of bulls occasionally show lesions which harbor abortion bacilli. It is very easy to assume that bulls with infected reproductive organs infect cows at the time of copulation; but to assume is one thing and to prove is another, and assumptions and confirmed facts are often contradictory. In this case the available evidence does not at all tend to prove that bulls infect cows through the act of copulation.

At the Experiment Station of the Bureau of Animal Industry it was proved that the seminal fluid of one naturally and two artificially infected bulls was contaminated with abortion bacilli. Cows served by these bulls have remained entirely free from abortion disease. Service occurred on neutral ground, where the exposure of the cows to the bulls was limited as strictly as possible to the act of copulation. The injection of suspensions of abortion bacilli into the uteruses of cows just prior to copulation has failed to infect them. The evidence that other workers have obtained relative to the infection of the cow with abortion bacilli at the time of copulation fails to incriminate the bull. This is all perfectly compatible with the rapid disappearance of abortion bacilli from the non-pregnant uteruses of cows. The habitat of the abortion parasite in the pregnant uterus is the chorionic epithelium or something else which does not exist prior to or at the time of copulation.

However, bulls must not be regarded as innocent carriers of abortion bacilli, as the expulsion of the bacilli from their seminal vesicles or other portions of their reproductive organs is not necessarily limited to the time of copulation, and we have no valid reasons to believe that abortion bacilli disseminated by bulls are less virulent than those which have their origin in cows. On the contrary, they may be found to be exceptionally virulent strains, as the relatively infrequent occurrence of lesions in bulls, notwithstanding their frequent exposure to infection, leads to the assumption that the exposures which cause the lesions must be to particularly virulent strains of bacilli, or that they must occur at a time when ordinary

susceptibility is somewhat enhanced, or that lesions are limited to bulls with abnormally low resistance.

In abortion-infected herds it would be a good plan to have separate quarters for bulls and to have all contact between bulls and cows limited to the time of service, which should occur on neutral ground or ground which ordinarily is not occupied by either the cows or the bulls.

It seems to me that we have, in all, four sources of abortion bacilli which must be taken into consideration in our efforts to combat Bang abortion disease, and that the four sources are those which I have tried to define, as follows: The udders of infected cows, the uteruses of infected cows, the discharges from the bowels of unweaned calves produced and suckled by infected cows, and bulls with infected reproductive organs.

Our knowledge on the susceptibility of cattle to the Bang bacillus points directly to pregnancy as the critical period. Calves, so far as we have been able to determine, are immune; at least those which are exposed to infection during the first three to five months of their lives and are known to have ingested an abundance of infected milk prior to weaning, if they are later protected against exposure, not only fail to show symptoms of abortion disease but are also negative to abortion tests. What the conditions are through which a small proportion of bulls and virgin heifers become infected remains unknown.

We know that virgin heifers may harbor abortion bacilli in their non-functioning udders after intravenous injections, and that bulls may harbor them in their testicles after direct injections into the testicles, but these are modes of exposure that do not occur in nature unless it is in the form of rare accidents. The results of such injections merely show that the udders of virgin heifers and some portions of the reproductive organs of bulls may serve as satisfactory places of residence for abortion bacilli.

It is my belief that the susceptibility of cattle for the Bang bacillus gradually increases from calfhood to sexual maturity; or, more definitely, that the organs of cattle in which the bacillus can maintain itself do not become a suitable habitat for it until considerable progress has been made toward sexual maturity, which practically amounts to saying the same thing twice. If heifers well advanced towards sexual maturity are persistently exposed to abortion bacilli, or are exposed under conditions which occasionally lead to the ingestion of massive doses, there is no reason for doubt-

ing that from time to time some of the bacilli may enter the lymph and blood streams through the mucosa of the digestive tract, and this would at once give them a location and significance identical with that of intravenously injected bacilli. Heifers and bulls which become infected, I am inclined to believe, are not likely to be common elsewhere than in severely infected herds and in herds in which sanitation is treated as something of minor importance.

We may conclude here that no special measures for the protection of calves against Bang abortion disease are necessary, and, tentatively, that it is desirable to begin the protection of all bovine animals, and especially heifers, as they near the time of sexual maturity.

The mode of infection with the cow clearly does not seem to be through the act of copulation or at the time of conception. Abortion bacilli will not live in the non-pregnant uterus, and when they are introduced into it at the time of copulation and care is taken not to injure the mucosa they do not cause abortion disease, nor does the cow afterwards react with abortion tests; and I have no doubt that Professor Williams is right when he asserts that, once the uterine seal has formed, an effective barrier has been erected against the entrance of bacteria into the uterus via the vagina. The danger of infection through the udder I have already discussed, and this leaves open only two other modes of infection, namely, ingestion and inhalation. The latter seems doubtful to me, because the Bang bacillus is a delicate organism and would hardly survive the drying and exposure to light which it would have to undergo before it could be sustained in the air in a way that would lead to its inhalation in a virulent state. This leaves ingestion as the likely mode of infection, and experimental evidence proves conclusively that the ingestion of abortion bacilli by pregnant cows causes them to contract abortion disease and to abort. Hence, special precautions should be taken against the contamination of the food and drink of cows with anything that may contain abortion bacilli.

I believe that one of the errors into which etiologists have been prone to fall is the belief that the channels of infection for germ diseases are the orifices or openings of the body nearest to the regions most commonly and severely attacked, notwithstanding that it is well known that nearly all parasites, bacterial as well as those of higher order, have favorite habitats in or on the bodies of their hosts, which they manage to reach no matter at what point or through

what means they enter. But this is a large subject which does not happen to be on the program at this time.

The main object I have had in mind in preparing this paper has been to present the subject of Bang abortion disease in a hopeful light. I know that a hard fight is ahead before the plague can be eradicated, but it is not hopeless, and its hopefulness is becoming more apparent every day.

In conclusion I wish once more to emphasize the importance of maternity stables in the control of abortion disease. Such stables mean the separation of the infected cows from the environment in which the infection they spread abundantly at the time of parturition can do most harm, to an environment in which it is relatively harmless and in which it can be more easily and economically destroyed.

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Dr. John I. Handley, formerly Assistant Professor of Veterinary Surgery and Clinic, Veterinary Department of Michigan Agricultural College, has just been discharged from the Army Veterinary Service. He entered the service September 4, 1917, as a second lieutenant assigned to the 41st Division. Immediately after his arrival overseas in April, 1918, he was assigned to the First Ammunition Train, First Division, and served continuously with that organization through the war and in the army of occupation. At the date of his discharge he held the rank of captain. Dr. Handley will locate in Atlanta, Ga., where he will be manager for the South-eastern Laboratories, Inc. Dr. Handley is a graduate of Alabama Polytechnic Institute, 1913; North Carolina State College, Bachelor of Science in Animal Husbandry, 1914, and North Carolina State College, Master of Science, 1916.

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*Semi-Weekly Farm News* (November 28), in giving an account of an attempt to blow up a dipping vat, says: "It is agreed with practical unanimity that dipping the cattle is reducing the ravages of the cattle ticks, and the gain is so much greater than the loss that there is only sporadic opposition to the dipping vats. Science is working for the farmers and stock raisers more enthusiastically these days than in any other era since history's beginning."

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"The National Department of Agriculture certainly has started something big and worth while in its Nation-wide campaign to promote the general use of purebred sires and to eliminate the scrub sire."—*Holstein-Friesian Register*, editorial.

## BACTERIOLOGIC STUDIES OF A PERACUTE DISEASE OF HORSES AND MULES<sup>1</sup>

By ROBERT GRAHAM, *Captain, V. C.*, FRANCOIS H. K. REYNOLDS,  
*1st Lieut., V. C.*, and DR. J. F. HILL, *Contract Surgeon, U. S. Army*

THE occurrence of a fatal disease in horses and mules at the Atlanta Stock Yards, Atlanta, Ga., was referred by Major R. M. Staley, veterinary inspector, Southeastern Department, to the Southeastern Department Laboratory, U. S. Army, for investigation. American Army horses and mules were not afflicted at this station, but the rapidly fatal character of an equine disease as observed in shipments belonging to private owners suggested the importance of ascertaining if possible the etiologic factor or factors concerned in the losses. Our investigations were started September 25, 1918, and continued as specimens from spontaneous occurrences of the disease were available. Specimens were not obtained during the preceding months of June, July and August, 1918, as comparatively few shipments of horses and mules are received at the Atlanta market during the summer months. Since mules are traded in large numbers at this point, the disease appeared more frequently in those animals than in horses.

According to the observations of Dr. William M. MacKellar, inspector in charge of the Bureau of Animal Industry, Atlanta, Ga., at least fifty cases involving a loss of approximately \$10,000 had occurred during the winter months of 1917-18, while losses during the shipping season of 1918-19 were even more frequent. Several shipments suffered a \$3,000 loss, and the total loss at this market approximated \$50,000.

The symptom-complex observed in afflicted animals resembled a peracute toxemia or septicemia-like infection. It was, however, not recognized as a specific entity by experienced persons. Information was therefore desired relative to the primary cause by attempting to eliminate or confirm the presence of known pathogenic micro-organisms capable of producing death of horses and mules. Chemic poisoning was eliminated by the examinations of the stomach contents under the direction of the Chemistry Department of the Georgia School of Technology.

<sup>1</sup>A report from the Veterinary Division, published by permission of the Surgeon General.

Preliminary to the bacteriological studies, the observations of Drs. MacKellar, Burkland, Boyce and Bahnsen (the latter State Veterinarian of Georgia) and Captain E. H. Stent of the British Royal Army Veterinary Corps, on over 100 clinical cases were carefully considered in order to ascertain more fully the influence of such factors as feed, age, condition of flesh, shipment, environment, etc., and thus to obtain the benefit of experienced counsel in the clinical disease from which certain pertinent facts were correlated as a basis of attacking the problem. An arrangement was completed with Dr. MacKellar whereby specimens from afflicted animals were delivered to the Department Laboratory, Fort McPherson, Ga., immediately following death. Later in the investigation the writers gathered specimens at the time the autopsies were performed.

#### OCCURRENCE

It was learned from the above-mentioned veterinarians that invariably symptoms of the disease developed subsequent to journey and often within 24 hours after unloading, suggesting the possibility of the fatal agent gaining entrance to the animal from infected cars, feed or water while en route, or a latent saprophytic intestinal infection invading the system incident to exposure in transit. The majority of animals showed symptoms in 48 hours following unloading, while a few cases were detected upon removal from the cars. The number of animals affected in a carload varied from 1 to 11 in the different shipments without respect to condition of flesh or age. In a December shipment, including 25 mules from Shelbyville, Ky., 11 deaths resulted on arrival at Atlanta within 36 hours after unloading. In another shipment of mules from Norlina, N. C., 6 deaths occurred within 48 hours after arrival at the Atlanta feeding pens. Three more animals of this group succumbed later.

Shipments where illness of this character occurred were, according to the records furnished by the railroad officials, unloaded and fed in accordance with the 28-hour law or as extended by consent of the owner. Available information of the source of several shipments wherein the disease developed, as well as the feeding points visited, gave no conclusive evidence of the origin of the infection, since numerous carloads were being handled at the same stations without ill effect.

The occurrence or extent of the disease at other markets has not been ascertained. Neither could comparisons be made upon the effect of placing feed in the cars in addition to or independent of feeding animals at local points during the journey. The British

Remount Commission operating in the United States had insisted that feed be placed in the cars to supplement the supply obtained at the unloading points. Among the thousands of animals which they had shipped over the American railroads, comparatively few losses resembling the disease under investigation occurred, yet it is not definitely known that the disease did not make an occasional inroad in animals purchased for England's Army.

TABLE 1.—*Date and origin of shipments wherein typical fatal cases were reported. Deaths occurred in Atlanta.*

| Date                         | Died                       | Shipped from—                     |
|------------------------------|----------------------------|-----------------------------------|
| Dec. 1, '17, to Feb. 25, '18 | Approximately 50<br>mules. | (Numerous points not<br>recorded) |
| February 25, 1917.....       | 4 mules.....               | Asheville, N. C.                  |
| March 6, 1918.....           | 3 mules.....               | Columbia, Tenn.                   |
| September 25, 1918.....      | 3 mules.....               | Unknown.                          |
| October 8, 1918.....         | 2 horses.....              | Unknown.                          |
| October 12, 1918.....        | 4 mules.....               | East St. Louis, Ill.              |
| October 13, 1918.....        | 1 horse.....               | East St. Louis, Ill.              |
| October 20, 1918.....        | 1 horse.....               | Unknown.                          |
| October 25, 1918.....        | 2 mules.....               | Unknown.                          |
| November 6, 1918.....        | 2 mules.....               | Unknown.                          |
| November 7, 1918.....        | 1 mule.....                | Unknown.                          |
| December 3, 1918.....        | 1 mule.....                | Elizabethtown, Ky.                |
| December 3, 1918.....        | 1 horse.....               | Elizabethtown, Ky.                |
| December 3 to 8, 1918..      | 11 mules.....              | Shelbyville, Ky.                  |
| December 16, 1918.....       | 1 mule.....                | Bryan, Mo.                        |
| December 23, 1918.....       | 9 mules.....               | Norlina, N. C.                    |
| December 30, 1918.....       | 4 mules.....               | Bedford, Ind.                     |
| December 30, 1918.....       | 1 mule.....                | Shelbyville, Ky.                  |
| January 2, 1919.....         | 2 mules.....               | East St. Louis, Ill.              |
| January 3, 1919.....         | 8 mules.....               | East St. Louis, Ill.              |
| January 5, 1919.....         | 1 mule.....                | East St. Louis, Ill.              |
| January 14, 1919.....        | 3 mules.....               | Bedford, Ind.                     |
| January 14, 1919.....        | 1 mule.....                | Gibsonville, Tenn.                |
| January 18, 1919.....        | 1 mule.....                | Kansas City, Mo.                  |
| January 20, 1919.....        | 1 mule.....                | East St. Louis, Ill.              |
| January 21, 1919.....        | 1 mule.....                | Louisville, Ky.                   |

NOTE—Animals shipped from East St. Louis, Ill., and Kentucky points were fed at Nashville, Tenn.

Animals shipped from small towns seemed to suffer a relatively high mortality, but horses and mules from the larger market centers were also afflicted. It is presumed that the shipments from smaller towns consisted of animals purchased in the immediate locality from which they were shipped. So far as could be discovered, the disease was incident to journey in all cases, but the definite relationship of feed, water, cars, loading chutes and feeding stations to which animals were exposed in shipment could not be ascertained.

#### SYMPTOMS

The clinical aspects of the disease, in the opinion of the writers and experienced observers, do not correspond with any known disease prevalent among equines.

The first noticeable symptoms of the disease consisted of partial loss of appetite and a sluggish, dejected appearance which, to the casual observer, might be regarded as a passing fatigue incident to journey. At this stage a careful clinical examination disclosed a discoloration of the mucous membranes and a pulse quite normal in rate but very weak in character, in fact a mere flutter. As the disease progressed the pulse became imperceptible. The mucous membranes were at first mildly hyperemic followed by varying degrees of cyanosis. A pronounced lingual involvement was designated "blue-tongue" by the laity, and this term is rather descriptive. Respirations were rapid, ranging from 40 to 45 per minute, with nostrils slightly distended. Muscular weakness in moving was noted, animals appearing restive and assuming decumbent positions for short periods of time. The organs of mastication and deglutition were apparently functioning normally, though the lower lip was usually pendulous. Animals would lap the water or wash the mouth continuously without swallowing, suggestive of dryness of the mucous membranes. Nervous manifestations observed before death were regarded as incident to a general intoxication. The temperature varied. In the initial stage of the disease it occasionally registered 105 F., but a temperature of 101 to 103 was more commonly observed. Increased languor and fatigue, plus a subnormal temperature, denoted approaching death. Animals commonly survived from 8 to 12 hours, though occasionally the duration of the disease was 24 to 36 hours. Rarely a few days intervened between the first noticeable symptoms and death. In most animals 2 or 3 hours preceding demise or during the death struggle there was a copious fetid liquid evacuation of the bowels. Diarrhea was a prominent symptom in cases less rapidly fatal. No evidence of pain could be detected by abdominal palpation. Recovery was not observed.

#### ANATOMICAL ALTERATIONS

The gross pathology in the organs and tissues, while strongly suggestive of the general character of the disease, could not be regarded as pathognomonic or suggestive of a particular etiologic factor. In several animals observed, the skin, subcutaneous tissue and musculature were normal, as were the lungs, pleurae, pericardium and thoracic lymph glands. The heart muscle was pale and showed a marked parenchymatous degeneration. The liver was flabby and showed passive congestion. The spleen in many instances was enlarged, soft and friable, punctate hemorrhages occasionally appearing beneath the capsule. The kidneys were friable, dark red in color,

and the capsule was easily removed. Body lymphatics appeared normal, while the mesenteric lymph glands were mildly enlarged and slightly injected.

It was reported by local veterinarians that some animals exhibited a hemorrhagic gastritis at autopsy, but the lesion was not consistent in the animals observed by the writers, and when present was very slight. A diffuse enteritis involving the lining of the cecum and colon was found in some cases, which was most marked at autopsy in animals which had been afflicted several days. The mucosa and submucosa of these organs were moderately infiltrated and diffusely discolored a scarlet red. The contents of the organs were fluid in character. Hemorrhagic areas and many small round necrotic erosions, varying in size from a pin-head to a pea, involved large areas of the lining. A plastic exudate adhered to these necrotic lesions. The latter was made clearly visible upon washing in water, and the inflammatory processes were accompanied by coagulation necrosis in diffuse areas.

Upon microscopic examination, following imbedding and staining, sections of involved cecum, the mucosa and submucosa showed extensive areas of edema and necrosis accompanied by hemorrhage. The morbid anatomy of the intestinal tract of animals showing areas of hemorrhagic and diphtheritic enteritis accompanied by coagulation necrosis was not to be observed in other fatal cases, though small patches of passive congestion and often a catarrhal inflammation was observed in the mucosa of the ileum, cecum and colon. The absence of macroscopical intestinal lesions in other animals suggested that fatality was not primarily associated with the gross pathologic alterations of the enteron, contributing to the possibility of a toxic poisoning or septicemia per se, which, if of intestinal origin, invaded the circulation without noticeable or marked local lesions.

#### OUTLINE OF INVESTIGATIONS

When practicable the procedure consisted in culturing the spleen, liver, kidney, heart blood, mesenteric lymphatics and intestinal contents of infected animals following death to ascertain the presence of bacteria of pathogenic significance. Pathogenes encountered and their relation to the spontaneous disease might then be interpreted by artificial transmission experiments. The examination of the specimens from spontaneous cases was attempted by the routine methods as follows:

- a. Aerobic micro-organisms.*—Agar in plates containing 5 per cent

human blood, plus one reaction to phenolphthalein, were smeared with the tissue from solid organs. Small bits of spleen the size of a pea were removed with sterile forceps after searing the capsule. Cotton swabs were also used to collect specimens for seeding purposes. Six plates of each specimen were often streaked with one piece of tissue to secure proper dilution of growth. Seeded plates were inverted and incubated at 37.5° C. Endo medium was similarly inoculated.

*b. Anaerobic sporulating micro-organisms.*—All media used for anaerobic cultures were boiled for 15 minutes and cooled quickly before inoculating. Cultures were made from the spleen and intestinal contents in tubes of dextrose broth, neutral in reaction, and covered to a depth of 2 cm. with neutral paraffin oil. Shake agar cultures containing 2 per cent dextrose of a similar reaction were also inoculated. Following inoculation anaerobic cultures were heated to 80° C. for 20 minutes and solidified by immediate cooling. Excluded from light, incubation followed at room temperature. Anaerobiosis was strengthened in shake agar cultures by adding a mixture of agar and glycerin, equal parts, to a depth of approximately 6 cm. in each tube. Both medium, after being inoculated, was placed in convenient containers and the air exhausted daily by a suction pump. Isolation of pure anaerobes was then carried out by the plate method of Dick,<sup>1</sup> substituting a glycerin agar mixture in place of the paraffin which was preferred in observing anaerobic colonies, in that it possessed the advantage of transparency which is not available in using paraffin.

*c. Animal inoculations.*—Spleen tissue from naturally afflicted animals, after being removed with aseptic precautions from beneath the capsule, was macerated in sterile saline solution with a mortar and pestle. One or two cubic centimeters of this suspension was inoculated subcutaneously into healthy rabbits. Cultural methods on rabbits following death were as described in *a* and *b*, though the heart blood, exudates and solid organs were cultured, omitting the intestinal contents.

Examination for pathogenic anaerobes proved negative, but to avoid overlooking such organism as *Bacillus botulinus*, which it seems may occur more frequently in animals than is generally conceded, naturally afflicted mules were treated with botulinus antitoxin, but with no success.

<sup>1</sup> References to literature at end of paper.

TABLE 2—Experimental Sero-Therapeutic Treatment Specific for *Botulinus* Intoxication

| CASES       | DATE         | HOUR<br>INOCULATED                                  | AMOUNT<br>INTRAVENOUSLY                      | CARDIAC<br>STIMULANT  | COMMENT  |
|-------------|--------------|---|--|---|--|
| 1.<br>Horse | Dec. 3, 1918 | 1:30 p.m.<br>2:30 p.m.<br>3:30 p.m.<br>4:00 p.m.    | 100 c.c.<br>100 c.c.<br>100 c.c.<br>100 c.c. | 45 c.c. campho-<br>rated oil subcu-<br>taneously every<br>hour. | Increase in heart ac-<br>tion and occasional<br>colic-like symptoms.<br>Died 5:00 p.m. |
| 2.<br>Mule  |              |   | None   | None  | Died 5:30 p.m.   |
| 3.<br>Mule  | Dec. 3, 1918 | 9:00 a.m.<br>10:00 a.m.<br>11:00 a.m.<br>12:00 a.m. | 100 c.c.<br>100 c.c.<br>100 c.c.             | Camphorated<br>oil as above.                                    | No change.<br>No change.<br>No change.<br>Some distress.<br>Died 1:00 p.m.             |
| 4.<br>Mule  | Dec. 3, 1918 | 9:00 a.m.<br>10:00 a.m.<br>11:00 a.m.<br>12:00 a.m. | 100 c.c.<br>100 c.c.<br>100 c.c.<br>100 c.c. | Camphorated<br>oil as above.                                    | No change.<br>No change.<br>Some distress.<br>Died 1:00 p.m.                           |

Five animals similarly affected received other medical treatment without results.  
Death occurred in these animals at approximately the same time.

During the months of September, October, November and December, 1918, as well as January, 1919, specimens from 37 fatal cases were received for examination. It will be seen from Table 3 that in approximately 22 per cent of the cases the organism being considered was recovered. In a few instances other organisms of the paratyphoid type were encountered, but these were given little consideration due to their infrequency and lack of virulence.

#### MORPHOLOGIC AND BIOLOGIC CHARACTERISTICS

In stained preparations the organisms appear rod-shaped with rounded ends, 0.5 to 1.5 microns long and 0.2 micron wide. Direct from the tissues of affected animals a tendency to bipolar staining was observed. This characteristic was not noted in artificial cultures, though involution forms were frequent in old cultures. The organism stains readily with ordinary aniline dyes and is Gram negative. There were neither spores nor capsules. Motility was active and flagellæ were demonstrated by Smith's modification of Pitfield's method.<sup>3</sup> "A saturated solution of bichlorid of mercury is boiled and poured while still hot into a bottle in which crystals of ammonia alum have been placed in quantity more than sufficient to saturate the fluid. The bottle is then shaken and allowed to cool. Ten cubic centimeters of this solution are added to 10 c.c. of freshly prepared tannic acid solution. To this add 5 c.c. carbol-fuchsin solution. Mix and filter."

In preparing films for staining, a small loopful of bacterial growth from an agar slant (24 hours) is transferred to about 20 c.c. of sterile distilled water and incubated for one hour at 37.5° C. (When inoculating the tube it should be held in a slanting position in order that the bacteria may be placed well down toward the bottom.) Thoroughly cleansed and sterile slides, free from grease, are employed. After incubating the suspension one hour, a loopful is carefully removed from the *top* and transferred to the slide, exercising care not to injure the organism. It is gently spread with a platinum wire, being careful not to touch the slide. It is then dried quickly, and is ready for the stain. It is a difficult procedure, and many failures result, however careful the technic.

"To stain, filter the above mordant directly upon the fixed preparation. Heat gently for three minutes, but do not allow to boil. Wash in water and stain with the following solution:

"Saturated alcoholic solution gentian violet..... 1 c.c.

"Saturated solution ammonia alum..... 10 c.c.

TABLE 3—Cultures from Sporadic Cases

(Plus sign denotes positive and minus sign negative. It appears that in 8 cases, or 22 per cent, the *Bacillus enteritidis* of Gärtnér was found.)



"Filter the stain directly upon the preparation and heat for three or four minutes. Wash in water, dry, and mount in balsam."

Growth occurred aerobically and it was found to be anaerobic. The growth upon agar plates containing 5 per cent human blood occurred in two forms, circumscribed colonies from light inoculations or an even growth spread along the line of inoculation with small budding colonies at the borders. The colonies varied in size from a pin-point to 0.5 cm. in diameter. The small colonies were round, convex and elevated, and when close together on the plate did not enlarge or become diffuse. Isolated colonies were larger, 5 mm. in diameter, round, convex, translucent, and of a distinct pearl gray or bluish tinge. After 48 hours' inoculation an opaque center is observed. The growth is glistening, opalescent, and is readily removed from slants, with salt or other solution, by rotation of the tube. Upon Russell's triple sugar medium (Andrade indicator plus lead acetate) a pink butt with gas formation and a lead sulphid reaction was noted, which reaction was indistinguishable from that of *Bacillus paratyphoid B*. Indol is not produced. Sugars including lactose, saccharose, maltose, mannite, dextrose, dextrin, xylose, arabinose, salicin and galactose (in Hiss serum water medium) were the only ones available for the determination of the physiological action of this organism upon carbohydrates. Tenbroeck<sup>4</sup> suggests the use of inosite to differentiate *Bacillus enteritidis* (Gärtner) and *B. paratyphoid B* culturally, but as it was impossible to procure this sugar it could not be tried. It is stated that medium containing this sugar is fermented by *B. paratyphoid B*. The few slight discrepancies appearing in the tables may have been due to the "war" quality of the sugars employed. For instance, *B. paratyphoid B* failed to alter medium containing dextrin.

Gelatin stab cultures showed a grayish, round, translucent colony about 0.5 cm. in diameter on the surface at the point of inoculation. After 48 hours, along the line of stab a faint beaded growth developed which was followed by the formation of a few lenticular colonies. The gelatin was not liquefied. There was a very thin discrete grayish line of growth after streaking the surface of a gelatin plate. Three days later the growth became wrinkled and opaque in character. Small colonies along the line of streak do not thrive nor are they characteristic. The growth on agar slants is heaviest at the base of the slant. Along the streak the growth is grayish and opalescent. On dextrose and glycerin agar slants the growth is similar to that on plain agar slants but more luxuriant. On

Loeffler's blood serum, Dorset's egg medium and Petroff's egg medium growth is not characteristic and spreads over the surface in a thin whitish film.

Beef extract broth (salt free) containing glycerin showed an even cloudiness in 12 to 18 hours. No color reaction was noted on the endo medium, while the character of the growth was similar to that upon blood agar, though not as luxuriant. The colonies were less opalescent and an amber color to transmitted light was noted.

In litmus milk slight acidity, then alkalinity, was noted during the first three days of incubation, but later a marked alkalinity was observed.

*Thermal death point.*—Due to the variable and unsatisfactory results gained from the use of 15-mm. tubes in determining this factor, 8-mm. glass tubing was employed. Cut in 7-inch lengths, one end was sealed by flaming, the other plugged with cotton, sterilized, partially filled with bouillon and autoclaved for 45 minutes at 15 pounds pressure. It was then incubated for 48 hours to insure sterility. These tubes were inoculated with Gärtner's bacillus and incubated for 24 hours, after which they were sealed at the open end by flaming and totally immersed in a bath registering 60° C., the tubes being removed after varying intervals from one-half to 60 minutes. All cultures heated for three minutes or more showed no growth upon being transplanted. A series of cultures heated at 55° C. demonstrated that 5 minutes at this temperature was required for the destruction of the organism.

*Destruction by disinfectants.*—Tubes of broth were treated with 5 per cent phenol to make dilutions varying from 1-100 to 1-5,000 of a bacterial suspension. Two-tenths of a cubic centimeter of the culture at a density used for agglutinatings was added to each tube. These were incubated for 24 hours, then cultured, the dilution of 1-500 prohibiting growth while that of 1-560 was not sufficient to destroy. When treated with freshly prepared Dakin's solution, growth occurred in dilutions of 1-1,000 but was negative at 1-400. In testing out tricresol 1-200 was found to kill while 1-400 did not.

In our investigations 229 specimens from equine feces, water and feed troughs were gathered to obtain data on the prevalence of this organism in the excrement and intestinal tract of healthy horses as well as in nature. Thirty-one samples of equine feces were examined which had been obtained from the Quartermaster's stables at Fort McPherson, Ga., while the remaining samples were taken from the stables, corrals and feeding pens belonging to

private owners at the Atlanta Mule Market. Samples were also gathered from the loading chutes and uncleaned stock cars at the Atlanta Stock Yards where the disease under investigation occurred sporadically. Specimens of dejecta were gathered on sterile swabs and planted on endo medium, each sample being numbered with an index as to its origin. Not over one hour elapsed between the time of gathering until plates were seeded and placed in the incubator. Suspicious colonies were picked and transferred to Russell's triple sugar medium for identification. Cultures from this medium were examined in stained films by Gram's method or were planted in broth, returned to plates of endo for repicking, or transferred directly from Russell's medium to Hiss's serum-water medium containing the various sugars, for further identification.

Through a process of elimination, by the use of endo, Russell's medium and Hiss's serum-water medium, 14 cultures of paratyphoid-like types were encountered. (See Table 16 under "Cultural Characteristics.")

#### GARTNER INFECTION IN ANIMALS

Mohler<sup>5</sup> records the presence of *Bacillus enteritidis* (Gärtner) in bovines suffering from fatal enteric disturbances, while Meyer, Traum and Roadhouse<sup>6</sup> have confirmed this observation more recently. *B. enteritidis* was also observed by Jensen in fatal enteric calf diseases. The occurrence of this organism in the intestinal disturbances of calves was, however, considered as secondary to *B. paracolon* and other true colon-like species, particularly virulent strains of *B. coli communis*. The strains of *B. paracolon* and *B. paratyphoid B* of this laboratory, while indistinguishable morphologically and culturally, may be clearly differentiated by serological tests. (See Tables 7 and 9.)

#### GARTNER INFECTION IN MAN.<sup>8</sup>

Of special interest is the food epidemic which occurred in Frankenhäusen in 1888. The source of infection was a cow slaughtered on account of severe enteritis. Fifty-seven persons became ill from eating of the meat. Some ate it raw, some had it boiled or roasted, three partook only of the broth. The symptoms were those of a severe gastro-enteritis followed by desquamation. Only one person, who had eaten of the raw meat, died. He was nursed by his mother, who later developed the same symptoms, probably as a result of infection from the discharges. Gärtner cultivated from the spleen

of the fatal case, also from the flesh and intestines of the cow, an organism he named *Bacillus enteritidis*.

In the following year Gärtnner found a similar organism in another outbreak of food poisoning at Cotta, near Dresden. The meat, in this case, came from a cow suffering from an inflamed udder. There were 136 persons affected, and of those 4 died; apparently all had partaken of raw meat. Cultures were obtained from the cow and from the bodies of 2 of the persons who had died, and, though they resembled *B. enteritidis* morphologically, they differed in being non-poisonous. Moreover, the flesh of the cow lost its poisonous property when cooked.

Van Ermengem in 1891 obtained from an outbreak at Morseele, Belgium, a typical *B. enteritidis*. In this outbreak 80 persons were affected, 4 of whom died. The flesh was derived from 2 calves which had a severe enteritis; one died and the other was slaughtered. The meat was eaten in a boiled or roasted state, though the isolation of the organism from the internal organs of one of the dead would indicate that part of it had not been sufficiently sterilized. An identical organism was obtained from the bone-marrow of one of the calves. Feeding or injection of mice, rabbits, guinea pigs and calves produced severe and fatal infection. A monkey developed typical cholera nostras, but recovered. Van Ermengem held that it was the same as the enteritidis bacillus of Gärtnner, a view which has been confirmed by the subsequent studies on agglutination.

In 1892 Fischer obtained an apparently true *B. enteritidis* from a food poisoning at Rumfleth. The same organism was obtained by him from meat which caused poisoning at Haustedt in 1905. The following year he met with the same organism in the spleen of a cow suffering with an infected udder.

Van Ermengem studied a case of poisoning in Ghent in 1895. A sausage made of pork and beef was examined by an inspector who, on account of its fresh appearance, pronounced it unobjectionable. He himself ate the raw sausage and others followed his example. They all became sick and the inspector died in five days. The animals furnishing the meat were not known to be sick. Cultures from the sausage demonstrated the presence of *B. enteritidis*.

In 1896, at Posen, cultures were obtained from a fatal case by Gunther. The bacillus differed from Gärtnner's bacillus in minor points.

In England the first application of the agglutination test in the study of these organisms was made in 1898 by Durham, who had

occasion to investigate four outbreaks of gastro-enteritis. In the first of these, at Hatton, 185 persons were affected, but the cause was not traced to meats of diseased animals. From the liver of a fatal case he obtained a bacillus which was agglutinated by sera of the sick in varying dilutions, in some as high as 1-1,000. The sera also agglutinated the typhoid bacillus to some extent. The Gunther bacillus and another from Vienna were agglutinated about the same as typhoid, but *B. enteritidis* was not clumped except in fairly high concentrations. By making these tests on different organisms Durham was able to show that the epidemic was associated with and probably due to a variety of *B. enteritidis*. In three other outbreaks studied by him the organism was not isolated, but from the behavior of the sera of sick to various bacteria it was made clear that the cause was essentially the same, i. e., a variety of the *enteritidis* bacillus.

In the Derby outbreak, 1902, the cause was traced to the eating of pork pies. About 210 persons became ill and there were at least 4 deaths. From the organs and intestines of victims Délépine isolated *B. enteritidis derbiensis*.

In Neunkirchen, 1903, another case of food poisoning occurred. Over 30 persons developed a gastro-enteritis and 3 died. From horse flesh which was used as food and from organs of two of the fatal cases Drigalski isolated a bacillus which was agglutinated by the serum of infected persons. This serum would likewise agglutinate *B. enteritidis* equally as well, and to a lesser degree *B. typhosus* and *B. paratyphosus*. Boiled cultures proved fatal to animals.

Osler further states that "it would appear that paratyphoid infections are essentially the same in kind as the typical meat infections," which, of course, would include *B. enteritidis*, and would correspond with the result gotten by the writer when feeding both *B. enteritidis* and *B. paratyphoid B* to horses. Both animals died after showing the typical picture of the spontaneous disease; clinically they could not be separated.

Edelmann<sup>9</sup> in his work on Meat Hygiene says:

"The character of the disease developed in this manner in man varies extraordinarily. According to van Ermengem, the symptoms in general show an *acute course* and develop as an attack of choleric, cholera nostras, or an inflammatory gastro-enteritis (*febris gastrica*), sometimes accompanied by *muscular weakness* and *ataxia*. Frequently the symptoms can be hardly distinguished from a *gastro-intestinal catarrh*. Mortality hardly exceeds 2 to 5 per

cent. According to recent observations, cases of so-called paratyphus belong within the sphere of action of the *Bacillus enteritidis*."

According to Stitt,<sup>10</sup> it has been noted that the bacteria (Gärtner) or their toxins may be distributed unevenly in the meat eaten, so that one person consuming the same meat may be made very ill while others eating this meat may escape infection. Infection of food may occur from the material carried by flies, or even from the feces of mice and rats deposited on foodstuffs. This organism (Gärtner) is very pathogenic for laboratory animals, producing a hemorrhagic enteritis and at times a septicemia.

Buchanan<sup>11</sup> points out that in man the disease may be diagnosed by the agglutination test, although with difficulty, for the various strains agglutinate differently, and blood from a typhoid or paratyphoid patient may show a marked capacity to agglutinate *B. enteritidis*.

It should be noted, he says, that various types of the paratyphoid bacillus are very similar to this form, if not identical, and doubtless are the cause of meat poisoning as well.

Speaking of the bacillus of Gärtner, Park and Williams<sup>7</sup> state that "in experimental animals immunity is produced by feeding and by injection. Immunity is produced not only against the homologous strain but, as a rule, also against related strains."

(To be continued.)

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*Kansas Farmer* (November 29) says editorially under the heading "Banish the Scrub Sire": "If half the effort had been spent in pushing for the universal use of the purebred sire that has been exerted in setting up new inexperienced men as breeders of purebred live stock, the general run of our market stock would rank much higher than it does. Breeders of purebred live stock would do well to line up with the Nation-wide program of boosting for an increased use of purebred sires in live-stock production."

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Dr. John F. Winchester, with his wife and daughter, stopped off at Washington en route from New Orleans. They visited the Bureau laboratories and became deeply interested in the work which is being conducted on bovine tuberculosis.

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Dr. and Mrs. N. S. Mayo, accompanied by Dr. and Mrs. H. R. Ryder, spent a fortnight after the New Orleans meeting in visiting Cuba.

## STUDIES ON ANTHELMINTICS

### VII. A comparison of castor oil and other purgatives in connection with the administration of some anthelmintics

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THE question as to the best purgative for use in connection with the administration of oil of chenopodium is an unsettled one, but the two drugs most used are castor oil and magnesium sulphate or Epsom salts.

The Third Annual Report of the Rockefeller Foundation, dated January, 1917, says (p. 191), in regard to hookworm work in Trinidad: "It was necessary to use magnesium sulphate instead of castor oil, because in Trinidad there is an exceedingly strong local prejudice against the latter and it is practically impossible to induce persons of the lower class to take it." Darling, Barber and Hacker (1918) state: "We divided the squads of men into halves. Those on one side of the ward were given magnesium sulphate; those on the other side were given castor oil. The castor oil squad always showed the greater number of cases of dizziness and deafness; most of the cases of inability to rise and walk occurred in this group. The urine of patients taking castor oil contained much heavier precipitates when tested for oleoresin than those that had taken magnesium sulphate. Dizziness and muscular incoordination were less with magnesium sulphate than with castor oil, compound mixture of senna or calomel." [In this connection, it is worth noting that Dr. David E. Buckingham, of Washington, D. C., has called the attention of one of us (Hall) to cases in his practice where deafness in dogs has followed the use of chenopodium with a delay of 12 hours or so in administering castor oil.]

On the other hand, the Third Annual Report of the Rockefeller Foundation, quoted above, notes (p. 193) the following case: "The most serious mishap was collapse in a child of three, on whom the second dose of magnesium sulphate had no effect. She recovered after a dose of castor oil." Heiser (1917) reports the death of 2 children in Ceylon, where magnesium sulphate was used, and in

<sup>1</sup> Resigned March 27, 1919.

comparing the results here with results in Sumatra, where there were no deaths in 300,000 treatments with chenopodium, he notes these differences in mode of administration: In Sumatra there were no dietary restrictions, no preliminary purgation, castor oil was used instead of magnesium sulphate, and the chenopodium was given in hard capsules. By way of comment, we may say that lack of dietary restrictions probably adds to a patient's safety, as a rule, but also commonly diminishes the anthelmintic efficacy; preliminary purgation has been abandoned by us as a routine procedure, as it seems to be unnecessary; of the 2 deaths cited by Heiser, 1 was a case where soft capsules were used, and 1 a case where no capsules of any sort were used; and the use of magnesium sulphate in the cases which died is apparently the only difference of importance. At that, there is the possibility of idiosyncratic intolerance to chenopodium or the presence of contraindications to the use of chenopodium in the cases where deaths occurred.

Fixed oils have been found of value in preventing chenopodium poisoning by Salant and Nelson (1915). Hall and Foster (1917, 1918) had excellent results with castor oil. In our experience—and we have here the data on 220 dogs which have been treated with chenopodium—the simultaneous administration of an ounce or two of castor oil with chenopodium gives very excellent results—good purgation and a high degree of protection against the gastro-intestinal irritation and the toxic effects. Some experiments indicating the protective action of castor oil in cases where double the minimum lethal dose had been given were published by Hall (1918) in Hall and Hamilton's (1918) paper on constituents of chenopodium. Those experiments showed the following results where 4 dogs were given 1.0 m. p. k. (mil per kilo) of chenopodium or a distillation product of chenopodium: One dog was given 15 mils of castor oil before treatment, 15 mils more with a chenopodium constituent, and 30 mils after the chenopodium, and was killed the sixth day after treatment. That the castor oil is protective, and not merely purgative, is shown by the fact that this dog passed no feces the first day after its treatment with double the lethal dose. A second dog was given chenopodium with the same amounts of castor oil in the same way, and was killed the sixth day after treatment. The protective action of the castor oil is again shown here by the fact that the dog passed no feces the first two days after treatment; the animal was then given another dose of 30 mils of castor oil. The other 2 dogs received the same amounts of chenopodium or chenopodium con-

stituent in 50 mils of liquid petrolatum, and died the day after treatment or the following day. A number of experiments show that liquid petrolatum diminishes the anthelmintic efficacy of oil of chenopodium and furnishes inadequate protection against toxic effects.

The protective action of castor oil against the toxic effects of oleoresin of male fern have been pointed out in another paper by Hall (1918). Of 5 dogs receiving 20 mils of oleoresin of male fern, a lethal dose, 1 dog received no purgative and died the sixth night after treatment; 2 received 60 mils of castor oil and were killed the sixth and eighth days after treatment; 1 received 30 mils of castor oil and was killed the eighth day after treatment; 1 received 6 grains of calomel and was killed the ninth day after treatment. To these records we may add the case of dog No. 180, a bulldog weighing 9 kilos, which received 20 mils of oleoresin of male fern and 6 grains of calomel, and was killed 8 days afterward. The dogs that were killed had recovered from the treatment and were in good physical condition. These experiments show that one essential in the administration of male fern is purgation. So far from castor oil increasing the absorption of male fern and making it more dangerous, it will save animals that have been given a lethal dose, as will calomel.

In the same paper, Hall (1918) notes that a little more than the lethal dose of 0.5 m. p. k. of chenopodium, administered to a dog with an accompanying 100 mils of olive oil, and followed by 50 mils more  $2\frac{1}{2}$  hours later, resulted fatally in less than 24 hours. A number of other experiments with sub-lethal doses shows that olive oil administered with oil of chenopodium affords little protection from toxic effects, hastens gastric absorption, and delays the passage of the drug from the stomach, with the resultant production of severe gastric lesions.

In the following experiments each of 4 dogs was given a lethal dose of 0.6 m. p. k. of oil of chenopodium. One hour later 2 dogs were each given 60 mils of castor oil and 2 dogs were each given 15 grams of magnesium sulphate. The results were as follows:

Dog No. 287, a hound weighing 9.5 kilos, showed chenopodium poisoning about 15 minutes after treatment. The chenopodium was given in hard gelatine capsules. Dog staggered and slobbered profusely. Within a half hour the animal had vomited and was lying down in its cage with feet outstretched. An hour after treatment an attempt was made to administer the magnesium sulphate, but

the animal was in no condition to swallow properly and a considerable part of the salts never reached the stomach. The dog was found dead the next morning. This can not be regarded as a test of magnesium sulphate, as conditions were unfavorable. The dog was a poor subject for treatment; the temperature was 102° F. before treatment, and the conjunctiva was inflamed, indicating distemper, and this was confirmed by postmortem examination. Anthelmintics are contraindicated in distemper and other febrile conditions, even when given in therapeutic doses.

Dog No. 282, a spaniel weighing 11 kilos, was given the chenopodium in hard gelatine capsules. The dog showed no immediate effects, but in a half hour it was staggering and slobbering. An hour after treatment it was lying down, unable to keep on its feet. It received the castor oil, and again lay down, setting its teeth in the wires of its cage. The next morning the dog was found dead; 60 mils of castor oil could not save this animal 1 hour after the administration of 0.6 m. p.k. of chenopodium.

Dog No. 284, a bull terrier weighing 9 kilos, was given the chenopodium without the use of capsules and lost over half of it. About a half hour after dosing, the dog vomited. At this time the dog was standing up and yelping noisily. An hour after dosing, the dog was staggering, and the magnesium sulphate was given at this time. The next morning the dog was lying on its side trembling. At 1:00 p. m. the dog was apparently unconscious, barking at intervals and moving the legs automatically and rather rapidly; temperature 96.3° F. At 2:00 p. m. the bark had changed to a whine. At 2:35 the dog was lying on its side, moving the legs in a swimming stroke, and stopping and whining at intervals; temperature 97.4° F. The second day after treatment the dog was lying in its cage unconscious, kicking very feebly and breathing very slowly. Temperature, 94 at 8:00 a. m.; 94.2 at 11:00 a. m.; 94 at 4:00 p. m. The dog was not seen the next day (Sunday), but was found dead the following day. The magnesium sulphate could not save this animal one hour after a dose of 0.6 m. p. k of oil of chenopodium. The dog was a young and active subject, but the eyes contained purulent matter before treatment, and the lungs showed a purulent bronchitis on postmortem; the temperature before treatment was only 100.4° F., however.

Dog No. 286, a terrier weighing 8.5 kilos, was in good physical condition an hour after the chenopodium treatment; it had vomited and was trembling, but was still active. Gave castor oil. Tempe-

ture 101 before treatment. The next morning the dog was sitting down and seemed drowsy; in the afternoon, the dog was standing, not trembling, and the temperature was still 101. The following day, the dog was standing up, but trembling and had not yet eaten. The dog was not seen the third day after treatment (Sunday), but on the fourth day the dog had eaten and was in good condition. The dog was killed 18 days after treatment. The digestive tract was normal. The castor oil saved the life of this dog. Possibly the absorption of chenopodium was slow for some reason, as it seemed to be, so that the castor oil was in ample time to exert its protective action.

Unfortunately, the above experiments do not give definite results on which to make a choice between castor oil and magnesium sulphate, and it is possible that no choice need be made. However, the experiments show that even after the lapse of an hour, following the ingestion of 0.6 m. p. k of oil of chenopodium, which is more than the m. l. d., 60 mils of castor oil will save a dog's life at times and will fail to save it at times. No conclusions may be drawn from the experiment with dog No. 287; it confirms the conclusion that anthelmintics should not be given to animals with distemper. Dog No. 284 got less than a lethal dose of chenopodium, received the magnesium sulphate, and died, probably on the third day; but this dog was not in the best physical condition. The experiments, then, throw no light on the protective value of magnesium sulphate, but do confirm the value put on castor oil for use with chenopodium.

#### SUMMARY

Experiments published in this paper and elsewhere show: That castor oil is highly satisfactory as a purgative after oil of chenopodium, not only by virtue of its purgative properties, but by virtue of a protective action aside from this. It will save the lives of animals receiving lethal doses of oil of chenopodium, when administered with the drug or an hour later, and will save animals given lethal doses of oleoresin of male fern when given with the drug. Calomel will also save animals when given with lethal doses of male fern. Liquid petrolatum affords but little protection against lethal doses of chenopodium and diminishes the anthelmintic efficacy. Olive oil retards the passage of chenopodium from the stomach and increases gastric absorption; it does not protect against lethal doses. Some medical men prefer magnesium sulphate to castor oil; our

data on this point are inadequate. Magnesium sulphate is not well suited to dog practice.

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Dr. E. L. Bertram, who for the last five years has been in charge of the Bureau of Animal Industry work of meat inspection at National Stock Yards, East St. Louis, Ill., has resigned from the Bureau to accept a position with the E. Kahn Sons Company, Cincinnati, Ohio, at a salary considerably in excess of that paid to him by the Government. Dr. Bertram entered the Bureau in 1899.

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Drs. U. G. Houck and J. R. Mohler returned from New Orleans by way of the Government Experimental Farm at New Iberia, La., and later inspected the offices of the Bureau of Animal Industry at Baton Rouge, La., and Jackson, Miss.

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The year 1919 is the centennial anniversary of the introduction of the stethoscope into practical medicine by René Laennec of France.

## CATARRHAL VAGINITIS IN THE DOG

By OSCAR SCHRECK,

New Haven, Conn.

SYNONYM.—Leucorrhea.

DEFINITION.—It is a subacute or chronic inflammation of the mucous membrane of the vagina, and may extend to the walls of the uterus.

ETIOLOGY.—In some cases it may be caused by the sequel of distemper, or inflammation of the mucous membrane, the result of coition, polypus, morbid growths, or catarrhal conditions, and difficult parturition. It is not a common disease in the small animals, and the few cases seen by the writer were caused by difficult parturition and catarrhal conditions. Still in some cases it may be due to violence at the time of serving or to local violence, as by inserting foreign substance into the vagina.

SYMPTOMS.—In the acute form the lips of the vulva are swollen, sensitive and injected and of a violet-red color on the internal surfaces. The disease is characterized by a whitish discharge from the vagina, and is accompanied by severe itching, the animal biting the parts more or less, to the great annoyance of the animal and owner. The general health of the animal suffers and the appetite fails. In some cases there is excessive debility. In the catarrhal condition the nose and eyes may also be congested. The animal will also be observed in some cases to drag the kind parts on the ground. As the disease advances the discharge becomes mucopurulent. Micturition and defecation are painful and difficult and the animal will change from place to place, trying to comply with the laws of nature, it is at this time that the discharge will be more noticeable. In the chronic stage the drain on the system leads to more or less weakness of the animal. In the chronic form, the mucous membrane may be thickened and rough or it may become relaxed and prolapsed.

TREATMENT.—The treatment must be both constitutional and local. Laxative food is very beneficial; in fact the bowels should work freely and without the straining generally seen in the dog. On this point I put a great deal of reliance and it is worthy of a great deal of attention in treating this disease. Alteratives and

tonics are indicated. The following case report will outline the best and most worthy line of treatment that is used by me.

**CASE REPORT.**—The animal, a Russian wolfhound, female, age 2 years; condition at the time of examination poor; temperature 102° F. There was also a loss of appetite, weak pulse, debility, with a vaginal discharge of milky, sticky fluid. The animal had been sick between 3 and 4 weeks before I was called. The eyes showed some conjunctivitis, the left eye being somewhat closed with mucous secretion; also a catarrhal condition of the nasal mucosa. The animal would draw herself along on her hind parts every little while and would lick and bite the vulva to the great annoyance of the owner. On examination the following was noted. Lips of vulva swollen and somewhat sensitive; the wall of the vagina of a violet red color; on the floor of the vagina was a muco-milky secretion, acid in reaction; the animal was not pregnant, nor in the period of estrum. I eliminated the possibility of the discharge being of a local nature. I also discarded the idea of uterine disease, or cancer of the uterus, for in cancer we have a peculiar persistent fetor of the discharge which is characteristic. This was not in evidence. I also discarded polypi, for in the latter the discharge is most often mixed with blood, which was not in evidence. I therefore made my diagnosis of catarrhal vaginitis, and the following treatment was given:

|                            |                           |
|----------------------------|---------------------------|
| Salol .....                | gr. XXXV                  |
| Olii resin cubebs.....     | dr. I                     |
| Balsam capaba (para) ..... | dr. II                    |
| Pepsin .....               | gr. XV                    |
| Misc. et fiat caps.....    | XV                        |
|                            | Sig. One capsule t. i. d. |

I also ordered an injection of 1-1,000 solution of pyoxtanin twice daily. The only objection to this latter treatment is the stain, but this is easily removed if the external parts are washed after each injection before drying. The solution must be made fresh at the time of using.

The treatment was continued until the discharge stopped. The dog is now a very much changed animal, and the owner is well pleased.

## ABSTRACTS

VACCINATION OF HERBIVORA AGAINST RABIES BY MEANS OF "ETHER-VIRUS." P. Remlinger. In *Bul. Acad. Méd., Paris*, July 3, 1919, vol. 82, p. 47-49. Abstract in *Bul. Inst. Pasteur, Rev. et Anal.*, Sept. 15, 1919, vol. 17, no. 17, p. 575, 576.

Goats were used in the experiments. The animals were injected in the muscles of the neck with 20 c. c. of a 1 to 50 emulsion of street virus capable of killing rabbits in 14 days. They were then separated into two lots, one serving for controls and the other subjected to vaccination. From 48 to 96 hours after inoculation with street virus the vaccinated animals received subcutaneously the entire emulsion (in 150 c. c. of water) of a fixed virus rabbit brain which had been left in ether for 72 hours. The checks succumbed to rabies on the twenty-third to sixty-eighth day after inoculation, while those vaccinated resisted the infection. These results, in all probability, can be obtained with cattle and horses, and it seems that hereafter it will be possible to vaccinate the latter by injecting them two or three times subcutaneously with two or three fixed-virus rabbit brains which have remained in ether for 70 to 75 hours.

L. T. G.

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AUTO-VACCINO-TOXINOTHERAPY IN APHTHOUS FEVER. G. Finzi. In *Nuovo Ercolani*, 1919, no. 3. Abstract by L. Panisset in *Bul. Inst. Pasteur, Rev. et Anal.*, Sept. 15, 1919, vol. 17, no. 17, p. 577.

During a serious epizootic of aphthous fever occurring in Italy, the author highly recommended the following manner of treatment: In an affected animal during the febrile period, blood is drawn from the jugular and immediately injected subcutaneously into the same animal (150 c. c. in adults, 50 to 75 c. c. in heifers and young steers, 20 to 25 c. c. in calves). The blood contains toxins and aphthous antigens, but its injection brings neither new virus nor added toxin to the treated animal. In animals which on account of previous attacks show only a slight or mild form of the disease, in spite of the increased virulence of the virus, the injection furnishes, in addition to the antibodies of the plasma and the formed elements of the blood, an abundance of toxins and aphthous antigens. In young animals the treatment is accompanied by a thermic and a general reaction; improvement follows these reactions.

The method can be recommended in centers of serious outbreaks of aphthous fever; its use arrests the mortality and hastens recovery in those treated. The operation is simple, since each animal furnishes its own treatment.

L. T. G.

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THE NATURE OF THE REACTION TO MALLEIN AND THE HEREDITARY TRANSMISSION OF ANTI-GLANDERS BODIES. E. Bertetti and F. Finzi. In *Rend. R. Accad. Lincei*, Dec., 1918, vol. 27. Abstract by L. Panisset in *Bul. Inst. Pasteur, Rev. et Anal.*, Sept. 15, 1919, vol. 17, no. 17, p. 557, 558.

Finzi, after his studies on mallein sensitization, has been able to affirm that the glandered horse reacts to mallein not only by producing specific antibodies, but also on account of a particular form of sensitization peculiar to glanders infection. Mallein should be considered as a substance containing a special toxin which, when arriving in the sensitized organism, constitutes a poison only for the animal affected with glanders. In denying that the reaction to mallein should be an anaphylactic manifestation, the authors consider that it is the result of a phenomenon of immunity.

Recent studies have confirmed Finzi in his first opinion. These have shown that if the reaction to mallein was connected with the presence of antibodies, it should exist in the animals hyperimmunized for the purpose of furnishing serums rich in antibodies; but the reaction is always wanting in these animals.

The study of the hereditary transmission of glanders antibodies brings new arguments in favor of the idea sustained by the author on the pathogenesis of the mallein reaction. Ten foals born of dams affected with glanders or in the course of hyperimmunization furnished an agglutinating serum and positive tests to complement deviation, but none of them furnished a reaction to mallein. If there is proof that the glanders antibodies pass through the placental membrane<sup>1</sup> (the foals having been found protected), the results obtained show clearly that the existence of antibodies does not suffice to explain the reaction to mallein.

L. T. G.

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<sup>1</sup>In the United States, Schoening has shown that foals from dourine-infected dams lose their reaction to the complement-fixation test after several months, indicating that transmitted immunity is only transitory.

EXPERIMENTAL STUDY OF THE THERAPY OF TUBERCULOSIS. G. Volpino. In Ann. Inst. Pasteur, 1919, vol. 33, p. 191-196.

The experimenter noticed that guinea pigs inoculated with extracts of tuberculous materials containing xylol did not become so severely infected as control guinea pigs inoculated with similar extracts containing no xylol.

Twelve guinea pigs were used in an experiment as follows: All were inoculated with portions of the same sputum moderately rich in tubercle bacilli. Sputum was ground in a mortar with 15 volumes of sterile water. Each animal received  $\frac{1}{4}$  c. c. in the internal face of the thigh.

Four days after infection the injection of xylol was begun on 6 animals, the other 6 remaining as controls. Dose,  $\frac{1}{2}$  c. c. xylol subcutaneously, over the abdomen. Local edema followed. The injections were repeated every 2 to 4 days, waiting longer if necessitated by extended infiltration.

Both antemortem and postmortem examinations of the animals showed, 46 days after infection, that the control animals had become much more severely infected than the animals receiving xylol.

In summarizing: It is found that with guinea pigs not too heavily infected, if treatment is begun 8 to 10 days after infection, they may be kept up to the fortieth day without manifesting anything other than signs of limited infection; whereas the control animals, beginning with the fifteenth to eighteenth day, show easily visible external alterations as well as extensive internal invasion. In order to obtain this result it is necessary to inject xylol as often as possible, in robust animals from  $\frac{1}{2}$  to 1 c. c. daily for 15 days.

Xylol is only slightly toxic to animals; rabbits were not killed by 4 to 6 c. c. injected subcutaneously; 600-gram guinea pigs tolerated 1 to 2 c. c. doses; sheep, 3 c. c. Prolonged treatment results in pronounced alterations of the skin; this makes it difficult to keep up the treatment until a complete cure is effected.

The mechanism by which xylol (and other hydrocarbons) exerts its antituberculous action seems to consist in large part in its stimulating effect on the phagocytic apparatus of the animal. In fact in preparations from tuberculous treated animals one finds that most of the bacilli have been ingested by phagocytes.

Tuberculous human subjects were improved by intramuscular injections of  $\frac{1}{2}$  to 1 c. c. xylol, although there were intense local reactions with fever and pain. This necessitated the abandonment

of this method of injection. Instead, the hydrocarbon was dissolved in sterile olive oil. Ten per cent solutions were well tolerated; 1 c. c. could be injected daily. Gradually, 20 per cent solutions could be injected without provoking dangerous reactions.

W. N. B.

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INTESTINAL INFECTION OF MAN CAUSED BY FOWL-CHOLERA BACILLUS.

Von Boer. In Zentbl. Bakt. Orig., vol. 79, p. 390.

The author describes a case of acute gastro-intestinal infection in a 32-year-old Russian prisoner of war, caused by *Bacillus avisepticus*. The bacteria could be isolated from the feces, but not from the blood. Recovery occurred after 6 days. W. N. B.

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THE INTRAVENOUS INJECTION OF TINCTURE OF OPIUM. Taskin. In  
Bul. Soc. Cent. Méd. Vét., April 3, 1919, p. 139-141.

As a result of the uncertain effect of opium administered by the mouth, the author tried tincture of opium intravenously in a number of cases of colic in the horse. He found that small doses (10 to 30 c. c.) produced a sedative effect, slightly superior to that produced by morphin, preceded by a slight intoxication. Large doses (60 to 90 c. c.) in cases of violent colic were not a success, nor would they produce narcosis when given prior to surgical operation. The initial phase was followed by a period of excitement lasting several hours and accompanied by tetanic spasms. When an equivalent dose of morphin was given intravenously, similar symptoms were produced, while the equivalent quantity of alcohol (60 to 90 c. c.) produced symptoms of intoxication solely. Therefore the writer concludes that in colic the intravenous dose of tincture of opium should not exceed 30 to 40 c. c.

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Dr. J. A. Gilruth, formerly a professor in the Veterinary College at Melbourne, Australia, and more recently Administrator of Northern Territory, Australia, spent a week in Washington, D. C., studying the various methods of tick eradication applied in this country. Later he visited Louisiana and Texas for the purpose of seeing the work in actual operation on the open range, with the view of submitting a complete report to his government, which is likewise confronted with the tick problem.

## ARMY VETERINARY SERVICE

### NEWS FROM THE SURGEON-GENERAL'S OFFICE

#### NUMBER OF VETERINARY OFFICERS ON DUTY

The Office of the Surgeon General of the United States Army has furnished the following information as to veterinary officers on duty.

Officers, Veterinary Corps, United States Army, with temporary rank as authorized by Congress in act providing for 18,000 officers until June 30, 1920, on duty on dates shown (1919):

|                          | Oct. 11. | Nov. 11. | Dec. 11. |
|--------------------------|----------|----------|----------|
| Colonels .....           | 0        | 0        | 0        |
| Lieutenant Colonels..... | 5        | 4        | 4        |
| Captains .....           | 77       | 75       | 72       |
| Majors .....             | 43       | 40       | 37       |
| First Lieutenants.....   | 167      | 160      | 156      |
| Second Lieutenants.....  | 86       | 74       | 72       |
| <br>Totals.....          | <br>378  | <br>354  | <br>342  |

Officers, Veterinary Corps, Regular Army, with permanent rank under act of June 3, 1916, on duty December 11, 1919:

|                         |        |
|-------------------------|--------|
| Majors .....            | 7      |
| Captains .....          | 17     |
| First Lieutenants.....  | 21     |
| Second Lieutenants..... | 47     |
| <br>Total .....         | <br>92 |

#### TRANSFERS AND REASSIGNMENTS

The following orders of transfer and reassignment have been issued for veterinary officers:

Major B. A. Seeley, U. S. A., from Camp Upton, N. Y., to Remount Depot, Camp Meade, Md., for duty as the veterinarian.

Major G. H. Dean, U. S. A., having completed his instruction in meat inspection, is relieved from duty with the Zone Supply Officer, Chicago, Ill., and assigned as Camp Veterinarian, Camp Bragg, N. C.

Major A. L. Mason, U. S. A., General Veterinary Inspector with headquarters at Kansas City, Mo., has been relieved from his present station and directed to proceed to Washington, D. C., for station and

duty as General Veterinary Inspector in that territory formerly covered by Major J. P. Turner and Lieut. Col. G. E. Griffin, U. S. A., which embraces the entire Atlantic Seaboard States.

Major W. R. Pick, U. S. A., General Veterinary Inspector, from Fort Worth, Texas, to San Antonio, Texas, for station to act as General Veterinary Inspector for the States of Texas, Oklahoma, New Mexico, Arizona, Montana, Wyoming, Idaho, Utah, Nevada, Washington, Oregon and California.

Major T. H. Edwards, U. S. A., from Auxiliary Remount Depot, Camp Jackson, S. C., to Auxiliary Remount Depot, Camp Gordon, Ga.

Lieut. Col. R. Vans Agnew, U. S. A., from duty as Post Veterinarian, Fort D. A. Russell, Wyo., to Camp Dodge, Iowa, for duty as Division Veterinarian, 4th Division, and Camp Veterinarian, Camp Dodge, Iowa.

Major G. H. Koon, U. S. A., from duty as Division Veterinarian, 4th Division, Camp Dodge, Iowa, to Zone Supply Officer, Chicago, Ill., for instruction in meat inspection.

Major H. S. Williams, U. S. A., on expiration of leave of absence is assigned as Division Veterinarian, 6th Division, Camp Grant, Ill.

Major A. E. Donovan, U. S. A., Division Veterinarian, 6th Division, on being relieved by Major Williams is directed to proceed to Siberia for duty as Chief Veterinarian, American Forces in Siberia.

Captain J. A. McKinnon, V. C., Chief Veterinarian, American Forces in Siberia, upon the arrival of Major Donovan is relieved from duty and directed to proceed to the United States for assignment.

Captain J. R. Stifler, V. C., Camp Taylor, Ky., to Kansas City, Mo., for duty with the Purchasing Quartermaster that place.

Captain C. B. Dunphy, V. C., from Headquarters Southern Department, Fort Sam Houston, Texas, to Chicago, Ill., for instruction in meat inspection.

Captain E. P. Coburn, V. C., from Camp Dodge, Iowa, to Kansas City, Mo., for duty with the Purchasing Quartermaster that place.

Captain E. P. O'Connell, V. C., from Remount Depot, Camp Devens, Mass., to Chicago, Ill., for instruction in meat inspection, upon the closing of the Remount Depot at Camp Devens, Mass.

Captain E. J. Cramer, V. C., upon the closing of the Remount Depot, Camp Custer, Mich., is directed to report to Chicago, Ill., for instruction in meat inspection.

Captain H. N. Beeman, V. C., upon the closing of the Remount Depot, Camp Sherman, Ohio, is directed to report to Camp Sherman, Ohio, for duty as Camp Veterinarian.

Captain H. H. Howe, V. C., from duty as Camp Veterinarian, Camp Sherman, Ohio, to Remount Depot, Camp Gordon, Ga., for duty.

Captain J. L. Ruble, V. C., from Remount Depot, Camp Gordon, Ga., to Chicago, Ill., for instruction in meat inspection.

Captain G. W. Brower, V. C., recently returned from duty as Department Veterinarian, Philippine Department, is directed to proceed to Chicago, Ill., for instruction in meat inspection.

Captain E. C. Conant, V. S., from Remount Depot, Fort Keogh, Mont., to duty as Transport Veterinarian, U. S. A. T. "Dix," Seattle, Wash.

Captain V. B. Wright, V. C., from duty as Transport Veterinarian, U. S. A. T. "Dix," to Remount Depot, Fort Keogh, Mont.

Captain H. R. Wise, V. C., recently returned from duty overseas, is assigned to duty with the 2d Division, Camp Travis, Texas.

Captain J. P. Divine, V. C., from Port of Embarkation, Hoboken, N. J., to 6th Division, Camp Grant, Ill., for duty.

Captain J. W. Crouse, V. C., upon the closing of the Remount Depot, Camp Dix, N. J., is directed to proceed to Chicago, Ill., for instruction in meat inspection.

Captain K. F. Hinckley, V. C., upon the closing of the Remount Depot, Camp Lewis, Wash., is directed to proceed to Chicago, Ill., for instruction in meat inspection.

Captain W. H. Dean, V. C., having completed the course of instruction in meat inspection at the Zone Supply Office, Chicago, Ill., is transferred to Fort Jay, Governors Island, N. Y., for duty as the Post Veterinarian.

#### HUMANE DISPOSAL OF BLIND ARMY ANIMALS

As a result of recommendations originating with Major John P. Turner, V. C., when he was serving as a General Veterinary Inspector, which were strongly concurred in by the Veterinary Division, Surgeon General's Office, the War Department recently changed the regulations regarding the sale of blind Army animals. For humanitarian reasons solely, blind animals, even if otherwise serviceably sound when inspected and condemned, will not be sold but will be killed.

## ASSOCIATION NEWS

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### UNITED STATES LIVE STOCK SANITARY ASSOCIATION

The twenty-third annual meeting of this Association was held in Chicago, Ill., December 1, 2 and 3, 1919.

In his address of welcome Governor Frank O. Lowden of Illinois referred to the meeting being held simultaneously with the International Live Stock Show which is the greatest in the world. "Its influence during 20 years has been felt in every corner of this country," he stated. The Governor spoke as a breeder of farm live-stock and referred to the service of the veterinary sanitarian as being beyond calculation. He said: "In tuberculosis alone you have accomplished the almost impossible." He referred to Europe being pretty well depleted of live stock and stated his opinion that "no farmer could afford to use anything but a purebred sire." And yet he recalled that there is only a small percentage of farms in America that do not pursue the old wasteful, extravagant method of using scrub sires. He concluded by stating: "Agriculture is the basic industry of any land. Without better methods of agriculture and especially without better methods in the live-stock industry, America will soon reach the stage where she can not feed herself."

In responding, Mr. D. A. Wallace, editor of "The Farmer," stated: "We have admired the understanding of the situation which Governor Lowden has shown in his address. Farmers are maintaining their equilibrium and will continue to act in the right way during the weeks and months to come." He referred to the awakening of the farm people to the necessity of formulating a national program of agriculture in its relation to our other great industries. He paid tribute to the memory of Dr. S. H. Ward, whose death occurred just after the meeting a year ago, and said: "His wonderful direction of his work, his broadness of vision, his great understanding, aided Minnesota to assume leadership in live-stock sanitary work among the States."

President G. W. Dunphy in his presidential address mentioned the valuable service rendered by the Legislative Committee in securing better salaries for inspectors of the Bureau of Animal Industry and considered it very important that efforts of the Association should be continued in this direction. He recommended

that some steps be taken to secure better protection of States from disease introduced by live stock moving through public stockyards.

Chairman Mat S. Cohen of the Legislative Committee recounted the experience of his committee in getting Congress to appropriate more money for salaries for B. A. I. men. He said the amount secured was a mere pittance and that a million dollars should be added. He referred to the restrictions on the appropriation for tuberculosis eradication which left the Bureau without sufficient funds for operation in this field.

The entire afternoon session on December 1 was given over to a symposium on tuberculosis. Several of these papers will be published later.

A session on swine diseases was held Tuesday morning, December 2. The session was opened with the presentation of a paper by Hon. W. W. Wright of Illinois, entitled "Safe and Practical Regulations for Handling Feeder Hogs." The paper led to a lengthy discussion in which many members of the Association participated, during which Dr. D. F. Luckey of Missouri asserted that a number of biological concerns were marketing impotent anti-hog-cholera serum, that one concern actually practiced "plugging" impotent with potent serum, and that heavy losses among hogs at the Kansas City stockyards were chargeable to this evil.

Dr. R. R. Birch of New York, in replying to Dr. Luckey, aptly pointed out that, since one or more serum companies had been accused of marketing unsatisfactory products, it should not be difficult to secure the correction of this evil if the name or names of the company or companies were frankly given.

Dr. A. W. Miller of the Bureau of Animal Industry stated that the immunization of hogs at the Kansas City stockyards until two years ago had not been under the supervision of the Bureau. Since then losses have been very materially reduced. He denied that any biological product concern uniformly turns out poor serum, and asserted that the losses at the stockyards were decidedly lower than Dr. Luckey claimed them to be.

Dr. J. I. Gibson of Illinois said that St. Joseph was a bad market from which to buy stock hogs, but attributed this to the length of time hogs are permitted to remain in the yards. He suggested that the order or regulation which permits hogs to remain in public stockyards five days should be changed to three days.

Great surprise at Dr. Luckey's statement was expressed by Hon. J. H. Mercer of Kansas. He advised Dr. Luckey to secure authority

from his State to eliminate the use of objectionable serum produced within his own State. He further said that Government supervision had been most helpful and that losses due to hog cholera had been enormously reduced. Like Dr. Gibson and several other speakers, he believed that losses among stockyard hogs were largely due to other causes than impotent serum, and that such losses were in a measure proportioned to the length of time hogs were permitted to remain in the yards.

Dr. A. T. Peters of Illinois advised that hogs should be gotten out of the yards as soon as possible.

A motion was made, seconded and carried that the United States Live Stock Sanitary Association appoint a committee of from three to five members, and that the Swine Breeders' Association be requested to appoint a similar committee, the two to confer with regard to possibly desirable changes in the present methods of dealing with hogs in stockyards.

A paper was next presented by Mr. Carmichael, secretary of the National Swine Breeders' Association, though his name did not appear on the program of the session. The title of the paper was "Regulations for the Shipment of Crated Hogs." The conditions under which purebred hogs are shipped were first defined and attention was then called to the troublesome and confusing differences in the various State regulations governing the shipment of hogs. A plan was made for uniform regulations.

Accompanying this paper a table was presented showing the lack of uniformity of State regulations for the year 1919 relative to the interstate shipment of breeding hogs in crates.

Dr. U. G. Houck of the Bureau of Animal Industry presented a report on the progress in hog cholera control during the year 1919, in which he called attention to the need for uniform regulations in different States relative to the movement of hogs, and proposed regulations which merit careful study.

Following this paper Dr. A. L. Hirleman of Georgia presented the report of the Committee on Hog Cholera, which had been printed and was distributed among the members of the Association.

Dr. A. T. Kinsley of Missouri next presented the report of the Committee on the Differential Diagnosis of Swine Diseases, in which the contradictory character of the ideas prevalent regarding these diseases was discussed and the need for distinguishing more sharply in the future between facts and theories was pointed out. A list of the names of the diseases which should be specifically

recognized was given. Hog cholera, because of its importance, was placed at the head of the list, and it was stated that our knowledge of the cause of this disease remains incomplete. Hemorrhagic septicemia was characterized as an affection which may be primary, but which is usually secondary; infectious abortion of swine as an evil which requires more attention in the future; conditions produced by the colon and paratyphoid group of bacteria as requiring better sanitary control. Tuberculosis, actinomycosis, anthrax, infectious rhinitis or bull nose, necrotic enteritis, etc., were also briefly discussed.

Dr. A. W. Dimock of Kentucky read a paper on the occurrence of the colon bacillus in the deeper tissues of swine, and expressed the opinion that the penetration of these bacilli into the deeper tissues was facilitated by, if not entirely dependent upon, the existence of abnormal conditions.

Dr. W. E. King of Minnesota presented a paper on the symptoms, lesions and diagnosis of conditions produced in hogs by *Bacillus paratyphosus* and *B. enteritidis*, and emphasized the need for the careful study of other hog diseases than that produced by the ultra-microscopic virus.

In the absence of Dr. Robert Jay of Tennessee, Dr. M. Jacob of that State presented a paper prepared by the former on the comparative symptoms and lesions of hemorrhagic septicemia and hog cholera. Attention was called to the transmissibility of septicemia to other species of animals; to the facultative pathogenic character of its bipolar organism, and to the dependence of the disease on environmental conditions, particularly a high protein diet, and diet too rich for the amount of exercise taken.

In the place of the paper of Dr. W. L. Boyd of Minnesota, a paper by Edward W. Boddington, Esq., was presented. Attention was called to the arbitrary and unfair character of some State laws for the control of hog cholera; the work of the Federal Bureau of Animal Industry was indorsed and the belief expressed that no biological products should be sold unless they were produced under United States license; the character of the laws needed was defined; State serum plants, while they may have been justified in the experimental stage, were condemned as failures.

The abortion disease session was held on Tuesday afternoon, December 2. Although this session was specially appointed for the consideration of abortion disease, it was opened with a discussion of the papers on swine diseases presented in the morning. The prin-

cipal matters brought out in this discussion were the need for making greater efforts to secure serum of the highest purity and freedom from contamination with extraneous bacteria, and the desirability of a meeting of Federal and State officers engaged in the control of hog diseases, such meeting to be called by the Federal Government.

Dr. M. Dorset of the Bureau of Animal Industry pointed out that it is a mistake to treat hog diseases with bacterins before we know what they are, often to the neglect of the use of serum, when we are practically all agreed that hog cholera has retained the rank of first importance.

Dr. Ward Giltner of Michigan, before presenting the report of the Committee on Abortion Disease, read a short paper, prepared by himself and not submitted to the committee, relative to the name which it seems desirable we should give to the group of phenomena generally spoken of as abortion disease.

The report of the committee was a concise statement of the known facts about infectious abortion disease of cattle and a formulation of the simple conclusions relative to the control of the disease to which the facts point.

A paper on the etiology of so-called infectious abortion disease of cattle was then read by Dr. E. C. Schroeder of the Bureau of Animal Industry. In this the known etiological facts of the disease were summarized and simple control measures suggested.

The next paper was by Prof. W. L. Williams of New York. In this the Professor's views on the pathology of sterility were presented and various references made to the causes of calf scours and other calf diseases, some of which were characterized as having an ante-partum origin.

Dr. E. T. Hallman of Michigan presented a paper on the sequela of abortion bacilli infection of the bovine uterus. The bacteria found in ten cases studied were given, and the belief was expressed that lowered vitality often gives ordinarily harmless bacterial organisms an opportunity to establish themselves and to exercise a true pathogenic activity.

Dr. John F. DeVine of New York gave only a synopsis of his paper on practical methods of handling herds affected with abortion disease. This paper merits the careful study especially of practicing veterinarians.

The discussion of the various papers was opened by Dr. George F. Jungerman of Kansas, who expressed the belief that the papers were not sufficiently practical in character. He spoke about the

great losses due to abortion disease in the Middle West, where calf troubles were also very common. He doubted the reality of the agglutination test when applied to single animals, but did not refer to the information that may be gained through its application to a herd.

In the general discussion it was brought out that the differences in the views held by different investigators on abortion disease of cattle are, in the final analysis, not very great, and that if there are factions they are gradually getting together. It was brought out strongly by more than one speaker that the harm that so-called secondary invaders may do can not detract from the importance of the Bang bacillus, the activity of which paves the way for the secondary invaders, which in most cases would be harmless organisms if the Bang bacillus could be eliminated. Bacterin treatment of abortion disease of cattle received very little attention, though one statement was made to the effect that autogenous bacterins used against secondary invaders had given remarkably encouraging results.

On Wednesday morning, Dr. L. Van Es being absent, the report of Committee on Diseases was read by Dr. D. M. Campbell. Attention was called to the wide propaganda on diseases of hogs and mention was made of the much talked of presence of hemorrhagic septicemia, mixed infections, "flu," etc. Recommendations were made that on account of the maze into which the veterinary profession is at present in regard to diseases of hogs, it is an opportune time to devote considerable effort to their solution. Abortion, it was said, is recognized as very infectious and very prevalent, and the importance of further scientific investigation was expressed. On account of the varieties of pneumonia of sheep and swine, it was declared, much investigation will be necessary to clear up these troubles. Dr. Van Es strongly recommended a Bureau of Statistical Data on the Diseases of Animals (communicable diseases).

In the discussion which followed it was pointed out that certain States do now attempt to be advised of the prevalence of contagious diseases and that there are statutory laws making it compulsory for veterinarians to report all such diseases, Illinois having just passed such a law, \$500 fine being the penalty for failure to comply.

Dr. B. H. Ransom of the Committee on Special Skin Diseases presented a very comprehensive and complete report on the prevalence of the skin diseases of animals, but principally of the wide prevalence of scabies at the present time in sheep and cattle, al-

though there is now actually less than at the close of the war period. The new centers of infection throughout the country were attributed to the going to war of the sanitary inspectors, the lack of help to do dipping, the general demoralized state of help, and the absolute necessity of moving sheep and cattle regardless of the scabies infection. The vicissitudes of dipping in cold weather were discussed and suggestions were made for compulsory dipping of feeder sheep at owner's premises. Lime and sulphur dips and nicotin dips were held to be the principal efficacious dipping agents.

Dr. Ransom went into details of strength of dips used and the manner of using them, and recommended that in treating cattle scabies hand treatment and scrubbing methods are important adjuncts to the actual dippings. It was pointed out that many treatments are at times necessary to overcome scabies and that in treating only affected animals it was found that as many as 5 to 8 treatments have at times been necessary. After treatment it might require 6 to 8 weeks before the animals regain normal health, as affected animals are in a very poor condition on account of the disease. Kerosene is at times beneficial in treating limited areas, but is severe on the animal's skin. Nicotin makes the cattle very sick at times, but after about two hours they begin to regain their stability after judicious use of cold water dashed on the face of the sick cattle.

Dr. F. Torrance of Canada, in speaking on the subject, stated that they had no sheep scabies in Canada and cattle scabies occurred only in restricted areas of the Northwest Provinces. He highly recommended that the temperature of the dip be raised to 110 to 120° F. and thought the results would be much better. He spoke of the almost impossibility of eradicating the disease in so wild a country, as sometimes a cow with calf would hide out when the rest of the bunch might be collected for dipping.

Dr. Adolph Eichhorn stated that it had been impossible to collect data for his proposed paper on the uniform State regulations of biological products.

Mr. F. R. Marshall of the Bureau of Animal Industry spoke on the subject of sheep husbandry and its changing character in the United States due to the breaking up of western ranges into smaller tracts because of farming operations. He presented the necessity of limiting the numbers of sheep in these States to meet conditions as they arose, but drew attention to the fact that irrigated farms could care for many feeder sheep when the range country became unable to do so. On account of different conditions on farms as

compared to range conditions more diseases in sheep will of course manifest themselves. Mr. Marshall suggested that the Live Stock Association should take up the matter of organizing agricultural staffs in each county to give advice on animal husbandry and animal diseases, stating that more educational and demonstration work is necessary, and indicated that a trained animal specialist should be in charge of the county bureaus.

Mr. Felker of New Hampshire cited a case of disastrous result from a demonstrator in sheep husbandry, and strongly advised that a veterinarian is the proper person to give advice on sanitary matters.

Dr. I. E. Newsom of the Colorado Agricultural Experiment Station read a paper on hemorrhagic septicemia as affecting the sheep industry in Colorado. He stated that although there were many outbreaks of the disease the losses except in rare instances were not exceptionally heavy, the disease usually dying out of itself after the animals had become used to their new environment. Dr. Newsom pointed out his belief that it is a probability that some predisposing factor, as shipping by train, hard drive, changed character of feed (perhaps to heavy protein diet), dipping, etc., is necessary in the incidence of the disease. The feed lots of Colorado and the lambing grounds, he said, are the usual centers of infection.

In the discussions that followed Dr. Kinsley supported the contentions of the essayist, while Dr. W. J. Butler of Montana expressed doubt that the losses of sheep were so universally caused by the hemorrhagic septicemia organism. Dr. Kinsley thought that disinfection of the yards and cars would materially reduce the number of outbreaks of the disease. In regard to preventive treatment, Dr. Newsom thought bacterins were of little efficacy and that possibly live organism treatment of the flock would be an effective preventive of the disease. Dr. Kinsley combated this suggestion and thought that it would be a hazardous undertaking.

Dr. L. E. Day, in discussing the statement that the disease often followed dipping, stated that although he had investigated quite a number of cases following dipping he did not find hemorrhagic septicemia in a single instance, although he had followed the post-mortem examination by the approved bacteriological methods for the detection of this disease. He thought that the deaths were due to pneumonia following exposure after dipping.

Dr. Butler mentioned a form of edematous pneumonia in sheep over 3 years of age occurring in Montana and producing a 5 per

cent loss of old ewes, that is not caused by the bipolar organism, and mentioned that sudden change of character of feed, as from short grass pasture to beet tops or beet by-products, will induce the pneumonia, and that it can be prevented by providing alfalfa or other good hay in addition to the beet roots.

At the final session in the afternoon, Mr. A. F. Stryker, secretary and traffic manager of the Omaha Live Stock Exchange, spoke on "Sanitation and Live-Stock Transportation," and made an earnest appeal for the stabilizing of the various State laws regarding the requirements for the entrance of animals into the various States. He thought that one law for all States should suffice, and complained of restrictive laws in certain States wherein no animals are permitted to enter the State in non-disinfected cars although the cars might be otherwise clean. Attention was also directed to the requirements in certain States of the tuberculin test of cows and bulls although on shipment of these animals from the public stockyards affidavits had been made that they were for feeder purposes and were shipped accordingly under interstate regulations.

In the discussion which followed, Dr. T. A. Burnett of Ohio gave as Ohio's reason for requiring tuberculin test and inspection and quarantine regulations the promiscuous dumping of reacting cattle into Ohio when the State is trying to clean up and is paying indemnity for reacting animals, and stated that the \$100,000 meant for this purpose is not intended for reactors brought in under the guise of feeders, when as a matter of fact unscrupulous cattle dealers, after bringing them into the State, sell them to whoever has the price.

Dr. B. F. Davis, State Veterinarian of Wyoming, showed how an affidavit was prepared by a commission firm in Denver for a carload of bulls "for feeders" and stated that the affidavit was fraudulent, also that the States are likely to be imposed upon by unscrupulous commission men and by unscrupulous dealers in cattle.

Dr. Robert D. Wall of Iowa explained fully why Iowa insists on the disinfection of cars by stating that cattle shipped in a car in which hog cholera hogs had been were likely to carry cholera to any farm they were taken to, and stated that many of the affidavits are obtained by fraud.

Dr. Gibson advocated cleaned and disinfected cars for all stock destined to the farm.

Dr. J. A. Kiernan of the Bureau of Animal Industry read proposed amendments to the regulations for the accredited herd plan which permitted the establishment of a supplementary herd list

wherein all cows must be free from the disease and reacting bulls must be kept segregated, serve cows on neutral ground and must be handled with a staff.

Mr. George McKerrow of Wisconsin was present at the afternoon session and availed himself of the invitation to speak on "The Sheep Industry." The ease with which he attacked the subject was proof of his mastery of this business, both in the production of wool and of mutton.

Dr. Gibson presented a series of resolutions, which were adopted. The movement for increase of salaries of inspectors of the Bureau of Animal Industry was indorsed and the Association's support was pledged in calling attention of Congress to such desirable legislation. The Bureau work on hog cholera control and tuberculosis eradication was approved. The continuance of scientific studies of all other swine diseases to facilitate their control was advocated.

Resolutions were passed that the Association should on any and all occasions champion the cause of the horse as having a proper and useful sphere in America which has been threatened by the over-zealous automobile propaganda.

The Association recommended that race horses, on account of the extreme care taken by their owners in preventing disease among them, be permitted to go in interstate traffic without being mallein tested, and that uniform State laws be advocated which will permit of such shipments.

Intensely interesting as the whole meeting was, everyone present at the closing session had a treat in the sparring that took place in the selection of suitable timber for officers for the coming year. Dr. Lester O. Howard, nominated by Dr. Butler and seconded by Drs. DeVine and Cassius Way, was defeated for the presidency by Dr. S. F. Musselman of Kentucky, nominated by Mr. Mercer, Live Stock Commissioner of Kansas, and seconded by Dr. Gibson of Iowa and Dr. Dunphy of Michigan. Drs. E. M. Ranck, F. A. Bolser, W. F. Crewe and J. Reeves and Hon. J. H. Mercer were selected as vice-presidents. Dr. D. M. Campbell of Chicago was selected as secretary-treasurer.

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#### OHIO STATE VETERINARY MEDICAL ASSOCIATION

THE thirty-seventh annual meeting of the Ohio State Veterinary Medical Association will be held in Columbus, at the Deshler Hotel, January 15 and 16, 1920.

The Committee on Local Arrangements and the officers of the Association are exerting every possible effort to make the thirty-seventh the most successful meeting, which bespeaks something when the excellency of former Ohio meetings is taken into consideration.

A study of the program, which has been mailed to the members of the profession, reveals the fact that a number of very important subjects have been selected by the men who will address the meeting. Some of the topics pertain to subjects the solution of which the profession is confronted with today.

The city of Columbus has been selected as the place of meeting for the A. V. M. A. in 1920. This being a fact, it behooves every Ohio veterinarian to attend the meeting of the State organization in January and to do his part by assisting in the perfection of plans whereby the State Association can most royally entertain the National Society next August.

The management of the Deshler Hotel is extending the hospitality and courtesies of the house. The hotel is centrally located, facing Broad Street, opposite the State Capitol. It is the most modern and up-to-date hotel in the State. It has a beautiful, spacious lobby, entresol and grand lounge. Conveniences unexcelled.

Address all inquiries in regard to details of the meeting to

R. I. BERNATH, *Secretary, Wauseon, Ohio.*

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#### NEW YORK STATE VETERINARY MEDICAL SOCIETY

DR. GANNETT has reported as follows on the clinical cases exhibited at the meeting of the New York State Veterinary Medical Society, held in Brooklyn in October.

The open navicular bursa case by Dr. R. S. MacKellar, operated upon by Dr. J. N. Frost, Professor of Surgery at the New York State Veterinary College, Cornell University, did well and walked home in about one month.

The 2-year-old colt furnished by Drs. Gannett and Risley and castrated standing by Dr. P. J. Axtell had a temperature of 105° F. on the fifth day. The wounds were opened, when considerable liquid escaped and the temperature subsided.

The roan gelding with quittor and ossification of lateral cartilage furnished by Dr. R. S. MacKellar and operated upon by Drs. Frost and Gannett did well for three weeks, when swelling and lameness appeared. A second operation was performed, some detached bone being removed, which resulted in prompt healing. In this case the

coronary band was left intact and recovery took place with no blemish on the hoof.

The 2-year-old stallion with an umbilical hernia about the size of a duck's egg, furnished by Dr. R. S. MacKellar and operated upon by Dr. Frost by stitching the skin without incising it, made a partial recovery. The size of the hernia was reduced about one-half. A second operation was performed by Dr. Frost at the end of five weeks; the skin over the hernia was incised down to the hernial sac or peritoneum, which was then pressed back through the hernial ring and stitched there. This operation resulted in a good recovery.

The bay gelding with necrosed first upper molar, furnished by Drs. Gannett and Risley, operated upon by Dr. Frost by extraction with forceps with considerable difficulty, did well and illustrates that trephining can be avoided in many instances.

The postmortem performed by Dr. S. A. Goldberg was upon an aged bay gelding which had been given a dose of aloes for intestinal obstruction. The physic operated and the animal did well for a few days, when pain again appeared and continued at intervals for six days, with impaired appetite but no rise of temperature until the sixth day. Then the temperature went up, pulse became weak, patient perspired, and death occurred. Postmortem revealed peritonitis with small amount of fecal contents in the abdominal cavity and a rupture of the cecum about 2 inches long near the ileo-cecal valve. This rupture was not recent, as the edges were granulating.

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#### PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION

THE Pennsylvania State Veterinary Medical Association will hold a meeting at Harrisburg, Pa., January 19 and 20, 1920. All veterinarians are cordially invited to be present.

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#### CENTRAL NEW YORK VETERINARY MEDICAL ASSOCIATION

THE tenth semi-annual meeting of the Central New York Veterinary Medical Association was held at Syracuse November 26, 1919.

The meeting opened at 10 a. m. with a clinic at the infirmary of Dr. J. A. Pendergast.

The following cases were operated on:

Gray gelding, tumor of the membrane nictitans; surgeons, Drs. E. E. Dooling and W. L. Clark.

Brown mare, pus in the nasal and frontal sinuses; surgeons, Drs. J. H. Stack and W. M. Long.

Roan pony, removing depressor muscles of the tail; surgeons, Drs. Frank Morrow and E. E. Dooling.

Black mare, removing the ovaries; surgeons, Drs. McAuliff and Boardman.

Bay stallion, median neurotomy; surgeons, Drs. Salsbury, Stack and Long.

Bay horse, median neurotomy; surgeons, Drs. Stack and McAuliff.

Roan horse, median neurotomy; surgeons, Drs. Stack and McAuliff.

Bay gelding, roaring operation; surgeons, Drs. Boardman and McAuliff.

Black horse, neurotomy of right hind leg at hock; surgeon, Dr. W. L. Clark.

At the close of the clinic the meeting was adjourned to the Hotel St. Cloud, where the business session was called to order at 3:30 p. m. by the president, Dr. W. L. Clark.

Roll call showed the following members present: Drs. D. A. Boardman, J. K. Bosshart, I. L. Buchanan, F. M. Burk, W. L. Clark, E. E. Cole, E. E. Dooling, O. P. Jones, W. M. Long, McAuliff, L. G. Moore, Frank Morrow, J. A. Pendegast, W. M. Pendegast, W. H. Salsbury, George A. Shaw, J. H. Stack, M. W. Sullivan, W. B. Switzer, W. M. Thompson, A. J. Tuxill, F. E. York.

Minutes of the last meeting were read, approved and ordered placed on file.

At this stage of the meeting the secretary received a telegram from Dr. J. M. Currie expressing his regrets at being unable to be with us, and wishes for a successful meeting. On motion by Dr. Dooling, seconded by Dr. Morrow, the secretary was instructed to write Dr. Currie in behalf of the society, expressing our regrets at his recent illness and congratulations for his recovery.

The special committee that was appointed at the June meeting to look into the matter of securing an operating table for the use of the society at its clinics reported that they had been able to secure one at the extremely low price of \$61.15, including transportation, repairs, and installing. They also reported that they had decided to install it in the infirmary of Dr. J. A. Pendegast, as he was willing to give the society the use of the infirmary in exchange for

his use of the table from one meeting to another. The action of the committee was approved by the society.

The following names were proposed for membership: Drs. Frank Burk, DeRuyter, N. Y.; W. M. Thompson, Skaneateles, N. Y.; W. H. Salsbury, Clifton Springs, N. Y.; George A. Shaw, Manchester, N. Y. The last two names were proposed as associate members, as they are out of the territory included in our charter. The above-named gentlemen were unanimously elected to membership.

At this time Dr. F. W. Sears, sanitary inspector of Syracuse, arrived and was introduced by the president. Dr. Sears gave a very interesting talk along the line of milk, meat and market inspection in cities and villages, holding very strongly to the opinion that the office should be filled only by a competent veterinarian. His talk brought out a good discussion and he answered many questions raised by the members, at the close of which a vote of thanks was extended to Dr. Sears.

Dr. O. P. Jones, being called upon, gave a very interesting paper in the form of a case report on azoturia. His paper brought out a good discussion, and showed that where raw linseed oil and turpentine had been used the results were generally good.

Dr. J. K. Bosshart was then called upon and presented a very interesting paper entitled "A Destructive and Undiagnosed Disease of Cattle in New York State." This paper also brought out a good discussion, and while others had had more or less of the disease, it still remained undiagnosed. Dr. Bosshart was of the opinion that it was a form of hemorrhagic septicemia.

Following these papers an animated discussion on a variety of subjects occupied the balance of the time.

No further business appearing, the meeting adjourned until June, 1920.

W. B. SWITZER, *Secretary.*

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#### CONFERENCE OF NEW YORK VETERINARIANS

The New York State Veterinary College at Cornell University will hold its annual Conference for veterinarians January 15 and 16. It offers a very attractive program.

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#### ONTARIO VETERINARY COLLEGE ALUMNI

A MEETING of the Alumni of the Ontario Veterinary College was called at New Orleans with a big number present. Graduates present were as early as 1880 and as late as 1916.

Dean McGilvray of the college gave an outline of the activities of the work at the college. It was the opinion of all present that the summer course with a preceptor as demanded by the college was a good idea and should be continued.



Memorial tablet at Ontario Veterinary College to members of the faculty, alumni and undergraduates who fell in the great war.

After discussion, all present were in favor of the president of the Alumni appointing a committee to campaign for funds in order that a scholarship might be maintained at the college to commemorate the life of the late Andrew Smith. The amount decided on was \$5,000. All graduates are requested to send their names and addresses to Dr. Tait Butler, 323 Falls Building, Memphis, Tenn., who will mail out particulars of the campaign.

Officers of the Alumni: President, L. Enos Day, Chicago, Ill; vice-president, George Hilton, Ottawa, Canada; secretary, Hubert Shull, Texarkana, Ark.; treasurer, S. Brenton, Detroit, Mich.

The organization will be extended at Columbus (A. V. M. A. meeting) next year.

HUBERT SHULL, *Secretary.*

#### INTERNATIONAL ASSOCIATION OF DAIRY AND MILK INSPECTORS

THE International Association of Dairy and Milk Inspectors held the eighth annual convention at Hotel McAlpin, New York City, December 4-6. The program covered a wide range of subjects relating to the supervision and improvement of milk supplies. Special committees of the Association reported regarding new legislation affecting milk and milk products, dairy farm inspection, transportation and marketing of milk, methods of bacterial analyses of milk, transmissible diseases, organization and administration of milk control, construction of dairy buildings and its relation to sanitation, pasteurization of milk and cream, and food value of milk and milk products.

## COMMUNICATIONS

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### NEW ORLEANS FRENCH OPERA HOUSE BURNED

*To the Editor:*

INASMUCH as a number of the veterinarians and their wives who attended the late meeting of the A. V. M. A. in New Orleans patronized the French Opera, it may interest them to know that the old historic structure was completely destroyed by fire on the night of December 3. Fortunately, however, no lives were lost.

The old building has stood for years as an exponent of one of the chief characteristics of the French descendants of southern Louisiana, their inherited love of art and their sociability. The edifice represented the finest traditions of new France, as evolved from the old. It held memories sacred to the élite of New Orleans in its earliest days. It was a temple of society, the one shrine where for generations friends and relatives gathered to mingle with one another and in the meantime hear the opera.

How unfortunate indeed that a structure so replete with memories of the past, so distinctly monumental, should have been destroyed. It is to be regretted that there are few enough such monuments in the provincial life of various sections of our country, and we can ill afford to spare any of them.

E. I. SMITH.

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### PUS IN FRONTAL SINUS

*To the Editor:*

Herewith is a veterinarian's mistake. Publish it if you think it of value.

On November 8 a client of mine living 12 miles north of Hankinson who was the owner of purebred Holsteins called at my office. He stated that his bull had a sort of bronchitis and he would be glad to have me see him. I examined the animal that same day.

HISTORY.—Animal had been sick about three days, had refused all feed, would lie down and took no interest in anything.

SYMPTOMS.—Animal recumbent but when made to get up he did so after some effort. Great depression, quickened breathing, back arched, left eye half closed and discharging tears over face, right eye partially closed but no discharge, drooling from the mouth, con-

stipation, very little movement of bowels on auscultation, temperature 104.5° F.

**DIAGNOSIS.**—After going carefully over animal and not finding any other symptoms, and as it was hemorrhagic septicemia time, I so pronounced it and advised vaccination and segregation of the bull, all of which was done.

On November 19 I received a hurry call from the same client, who was very much upset. He said, "Doctor, the \$500 cow that stood alongside the bull is sick, I am afraid she is going to die." This case was simple, being only a mild attack of indigestion that responded beautifully to the usual treatment.

After treating the cow I asked to see the bull. On entering the boxstall I noticed the odor of rotting flesh and so remarked to the owner. I asked him to catch the bull, which was apparently well, and I made another examination. I discovered some pus around the base of the left horn, which was only about one inch long, having been dehorned one year previously. On testing the stability of this horn I found it loose. With the aid of a pair of scissors and pincers the shell was removed. Immediately a lot of thick pus flowed out through the horn core. I opened up the passage into the frontal sinus, which was filled with pus. A hole was trephined and the sinus cleaned out, and at date of writing the bull is well, but the trephined hole is not quite healed. I am satisfied that I made a mistake in diagnosing hemorrhagic septicemia.

CHARLES H. HART,  
*Hankinson, N. Dak.*

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Dr. and Mrs. W. Herbert Lowe spent a few days in Washington on their return trip from New Orleans. They were particularly pleased with their visit to the Bureau of Animal Industry Sheep Farm at Vienna, Va., and the Experiment Station at Bethesda, Md., where they renewed their friendship with Drs. Cooper Curtice and E. C. Schroeder, respectively, in charge of these stations.

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*The National Geographic Magazine* for December contains a most interesting discussion of the reindeer industry in Alaska as fostered by the Department of the Interior. "The present need," the author states, "is for a scientific study of the animal. The importance of the industry demands it." Reindeer meat from Alaska is now shipped to Seattle and Minneapolis for distribution.

## MISCELLANEOUS

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### BREEDERS AND VETERINARIANS DISCUSS TUBERCULOSIS

DURING the International Live Stock Exposition at Chicago a conference of live-stock owners, representatives of the thirteen purebred cattle breeding associations and State and Bureau of Animal Industry live-stock sanitary officials was held at the Saddle and Sirloin Club. The purpose of this conference was to discuss the subject of tuberculosis and especially the accredited herd plan.

After a very sumptuous beefsteak dinner a number of short speeches were made by the representatives of the purebred cattle associations, followed by short talks by several State and Federal live-stock officials. It was the unanimous voice of the conference that the campaign of eradicating tuberculosis be carried on along conservative and progressive lines, but that it will be necessary to broaden the scope of the work by extending supervision over a larger number of herds than is permissible with the present funds appropriated for the work.

Discussion centered on two questions:

1. Keeping herd bulls which react to the tuberculin test.
2. The desirability of modifying present Federal regulations so that the owner of an accredited herd on finding a reacting animal can have the herd tested in 90 days or so and repeat if necessary, in order that he need not be off the accredited list for a longer period than absolutely necessary.

Both breeders and veterinarians talked to these questions.

Several veterinarians urged that the rules be modified so that reacting herd bulls of merit could be retained on what Dr. Mohler, Chief of the Bureau of Animal Industry, called "neutral ground." This amounted to segregating the bull under the Bang plan as practiced in Denmark. The bull would be put to the cows outside of his lot or paddock and proper measures taken to prevent his transmitting infection to the females.

Dr. Dunphy of Michigan upheld this plan in several talks, citing the case of the Holstein bull Hengerveld DeKol, which reacted as a yearling and was saved, and which proved later to be one of the greatest sires of the breed. Others who concurred were Dr. Charles

E. Cotton of Minnesota, Senator A. B. Hackney, Holstein breeder, of the same State; Dr. J. I. Gibson of Bloomington, Ill., and others.

A. B. Cook of Townsend, Mont., president of the American Hereford Breeders' Association, made vigorous objection to any modifying of rules. He declared that he did not want to buy an animal from a herd headed by a reacting bull. Dr. W. J. Butler, State Veterinarian of Montana, said it would never be practicable to retain reacting bulls under range conditions. They would have to be kept under some sort of Government supervision if kept at all. J. C. White of Winterset, Iowa, president of the Aberdeen-Angus Breeders' Association, opposed the idea also. J. C. Glover of Wisconsin asked how many farmers were fixed so they could keep a diseased bull safely.

C. P. Norgord, Agricultural Commissioner of Wisconsin, told of the progress of the work in that State. By Christmas every herd would be tested in Waukesha County, where the work was being done on the "area" plan. The State makes an annual appropriation of \$250,000 to carry on the work. Until they began to test whole herds not much progress was made. Testing single animals, he said, was like acting as an insurance company for dealers.

Other speakers were F. W. Harding, secretary of the American Shorthorn Breeders' Association; Everett C. Brown, president of the Chicago Live Stock Exchange; Thomas E. Wilson, Shorthorn breeder and packer, of Chicago.

Dr. D. F. Luckey of Missouri pleaded for the use of the intradermal test. He claimed this made it possible to test four times the number of cattle and had proved very effective.

On motion by Prof. Smith a committee of five breeders was named to meet with a committee from the United States Live Stock Sanitary Association to thrash out the questions at issue. The breeders named were: John Tomson, president American Shorthorn Breeders' Association, Dover, Kans.; A. B. Cook, Townsend, Mont.; J. C. White, Winterset, Iowa; Fred Pabst, Oconomowoc, Wis., and George P. Grout, Duluth, Minn.

The committee from the Sanitary Association was: Dr. J. A. Kiernan, Washington, D. C.; Dr. Charles E. Cotton, Minnesota; W. W. Wright, Springfield, Ill.; Dr. Frederick Torrance, Ottawa, Canada, and Dr. Peter F. Bahnsen, Georgia.

Two sets of resolutions were unanimously adopted. The first petitioned Congress to transfer the unused balance provided for the payment of indemnities in the tuberculosis eradication appropriation

of the present year to the operating fund to be expended in that campaign at the discretion of the Secretary of Agriculture. At the present time the division of the funds for operating expenses and the payment of indemnities is unbalanced, inasmuch as only \$500,000 is provided for operating expenses and twice that amount for the payment of indemnity. The second resolution petitions Congress to make an annual appropriation of \$2,500,000 for tuberculosis eradication work.

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#### “COOPERATION” THE KEYNOTE IN TUBERCULOSIS ERADICATION

THE campaign of eradicating tuberculosis of live stock on a co-operative basis has been in progress less than 2 years, but in that time it has gained so much popularity among the live-stock owners that much larger funds are required for the work.

On December 10, 1919, the Agricultural Committee of the House of Representatives held a hearing on the subject of tuberculosis eradication. In attendance at that hearing were:

Mr. Evert C. Brown, president The Chicago Live Stock Exchange.

Mr. Frank W. Harding, secretary American Shorthorn Breeders' Association.

Mr. M. D. Munn, president American Jersey Cattle Club.

Mr. S. M. Shoemaker, representing the American Guernsey Cattle Club.

Mr. A. B. Cook, president American Hereford Cattle Breeders' Association.

Dr. A. F. Woods, president Maryland Agricultural College.

Prof. H. R. Smith, live-stock commissioner, Chicago Live Stock Exchange.

Dr. J. A. Kiernan, chief, Tuberculosis Eradication Division, Bureau of Animal Industry.

Dr. J. R. Mohler, chief of the Bureau of Animal Industry.

Each of the above-named gentlemen addressed the committee and set forth the progress of the work and the tremendous demands for its expansion. Probably the most impressive feature of this conference was the fact that the thirteen purebred cattle associations of the United States were represented and unqualifiedly indorsed the campaign now in progress. It could not help but impress the Congressional committee that this work is being carried on through the cooperation of the live-stock owners, live-stock sanitary officials of the respective States, and the Bureau of Animal Industry.

One of the important features of the work is that there is nothing

coercive about it; it is being conducted solely upon voluntary lines. If an owner does not think he should eradicate tuberculosis at this time it is purely optional with him. The fact stands out very prominently, however, that this very course which is being pursued is the one thing that helps to make it popular, because it is based upon educational lines and the live-stock owners appreciate the fact that it is unprofitable to maintain a herd in which tuberculosis exists. The live-stock owners further appreciate the fact that prospective owners of cattle realize now more than ever before the necessity of purchasing healthy animals to bring into their herds; they are seeking out the herds that are known to be free from tuberculosis, or herds the owners of which are using every means to exterminate the disease.

The cooperating forces are fully cognizant of the fact that to make satisfactory progress in the tuberculosis eradication campaign it is necessary to employ the services of trained private veterinarians, and as an indication of the desire of all the cooperating forces to link up the private veterinarian with the officials in the work the accredited herd plan was recently amended so as to permit the testing of herds under the supervision of specially appointed private veterinarians under rules and regulations of the Bureau of Animal Industry. The amendment to the accredited herd plan is as follows:

"When a herd has been officially accredited continuously by the United States Department of Agriculture and the State for a period of two years, it may then be tuberculin tested annually by any veterinarian whose name is upon the accredited list of veterinarians approved by the United States Bureau of Animal Industry, provided that before any veterinarian other than one who devotes his entire time to the work of any State or the Bureau of Animal Industry can be approved for accredited herd work he shall have passed an examination conducted by the proper live-stock sanitary official of the State in which he resides and the Bureau of Animal Industry. He then shall be eligible to conduct annual tuberculin tests upon herds which have been officially accredited, upon dates approved by the proper State live-stock sanitary official and the inspector in charge of the Bureau of Animal Industry in the State wherein the herd is located.

"No herd test can be made by such an approved veterinarian unless he has instructions in writing from the State official to that effect. The dates of the annual tests for each herd shall be recorded in the State office and also in the office of the inspector in charge. On any annual test the State and the Bureau reserve the right to have a regularly employed official present on the farm to supervise the testing done by the approved veterinarian.

"The approved veterinarian shall conduct each test strictly in

accordance with instructions issued by the Bureau of Animal Industry to employees engaged in cooperative tuberculosis eradication work. At the conclusion of each test the approved veterinarian shall submit to the State Veterinarian and the inspector in charge of the Bureau of Animal Industry a copy of the record of the test.

"Any animal of a herd under supervision which may react in any herd tuberculin tested by an approved veterinarian shall be marked for the purpose of identification in accordance with the regulations of the State in which the animal is located.

"Tuberculin tests applied by veterinarians other than those regularly employed by the State and the Bureau of Animal Industry shall be paid for by the owner of the herd."

No campaign for eradicating an infectious disease of live-stock has ever been undertaken under more favorable conditions. The keynote of the whole campaign is "cooperation." This is an opportunity of which the veterinarians of the United States should take advantage. They should enter into it with a spirit of energy and with the determination to be of the greatest possible service to the live-stock industry of America. It is not a matter for personal gain; it is not to create positions for live-stock sanitary officials; it is not to obtain large appropriations from the respective States and from the Federal Government. It is a campaign started out of necessity because of the rapid spread of tuberculosis among cattle and swine. The live-stock interests of the United States demand that if tuberculosis is an eradicable disease prompt and vigorous efforts be immediately put in operation to exterminate it.

The whole campaign is based upon the patriotic desire of American citizens to make the live-stock industry of this Nation the peer of any in the world. This can be done if every person engaged in the campaign fulfills his obligation—and there is an obligation to be fulfilled. Responsibility for the control and eradication of tuberculosis of live stock rests not only upon the shoulders of the State live-stock sanitary board and the Bureau of Animal Industry; it rests upon the shoulders of the live-stock owners themselves, and it rests largely upon the veterinarians of the United States. It has been demonstrated to a wonderful degree that all of these forces can work harmoniously together, and that, working in that direction, they can succeed in any undertaking upon which they embark. They have succeeded in this work up to date, and they will succeed from year to year according to the perfection of their organization and the degree of enthusiasm with which they carry on the campaign.

### WHY THE BAND PLAYED "DIXIE" AT THE INTERNATIONAL

WHEN the Hereford bull, Point Comfort XIV, won for the South the grand championship for the breed at the International Live Stock Exposition of 1913, many northern people felt that the occurrence was a "fluke" which was not likely to be repeated often.

But the record of the International Live Stock Exposition held at Chicago November 29 to December 6 demonstrated the possibilities of the South as a live-stock producing section in a remarkable way. Nine grand championships were won by breeders south of the Ohio River, as follows: Shorthorn bull and cow, Hereford bull, Aberdeen-Angus bull, Percheron mare, Duroc Jersey boar, Poland China sow, and Hampshire ram and ewe.

Not all of these animals were actually bred on southern farms, but the fact that they were shown from southern herds is an illustration of the progressive spirit of the southern breeders, and those which were bred and raised on southern farms show clearly that the South can produce as fine breeding stock as any other section of the country.

In addition to the winnings in the live-stock judging, the college judging team from the Texas A. & M. College won first in the students' judging contest, and the team representing the Texas agricultural clubs won second by one point only in the noncollegiate judging contest.

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### WHAT PART SHOULD THE FARM ADVISER TAKE IN THE CONTROL OF ANIMAL DISEASES?

ROBERT GRAHAM in "*The Extension Messenger*"

THIS question has been repeatedly submitted in one way or another by various men in formulating a policy to guide their own activities. Disease control is one of the most important problems of any live-stock producing county, and the farm adviser, in the opinion of the writer, can render a valuable service and mold in a large degree the plan of procedure in many instances.

It is not the function of the county farm adviser to vaccinate animals or to administer treatment, but rather confine his activities to the bigger problem of disease control, by offering pertinent advice to the owner. The danger of buying disease, the need of prompt action on the appearance of the disease, the dollars and cents value of quarantine and farm disinfection, the danger of feeding "cure-all"

medicines and the advisability of calling a veterinarian early are among the important questions in disease control which the Farm Bureau agent can emphasize in his activities.

If veterinary service is indicated in the capacity of diagnosis necessitating autopsy, or in the treatment of animals, it is conceded that this belongs to the qualified veterinarian. In other words, Farm Bureau agents should encourage the employment of the local veterinarian where his services are indicated, with the understanding that the veterinarian will render a professional service for a reasonable fee. It is reported that some veterinarians have overcharged, but these cases are comparatively few, and fortunately live-stock owners have ample recourse by refusing to employ these men.

Under prevailing conditions there is need for the advisory work of the Farm Bureau agent in disease control, but it is obvious that the greatest accomplishment implies cooperation with the local veterinarian and each need assume their responsibility to the live-stock industry without controversy.

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#### LIVE-STOCK IMPORTS FROM ENGLAND PREVENTED BY FOOT-AND-MOUTH DISEASE

THE importation from England of cattle and all other ruminant animals and swine is being held up by the United States Department of Agriculture on account of an outbreak of foot-and-mouth disease in the Isle of Wight. The present ban will be in force until 30 days have elapsed after all the animals exposed to the malady have been disposed of and the contaminated premises have been thoroughly disinfected.

This last outbreak occurred late in October, and is the most recent of several which occurred at irregular intervals in different parts of England during 1919 and 1918. Some of the previous outbreaks have been in Warwickshire and Dorsetshire. At different times the Department of Agriculture has been on the point of resuming importation, when the disease would be discovered in a new region. Dealers have put in applications for permits to import a total of 850 cattle, but have been prevented from doing so on account of this ban. Probably there are many others who have not yet made formal application for permits to the department. All of the cattle to be imported from England are purebreds.

